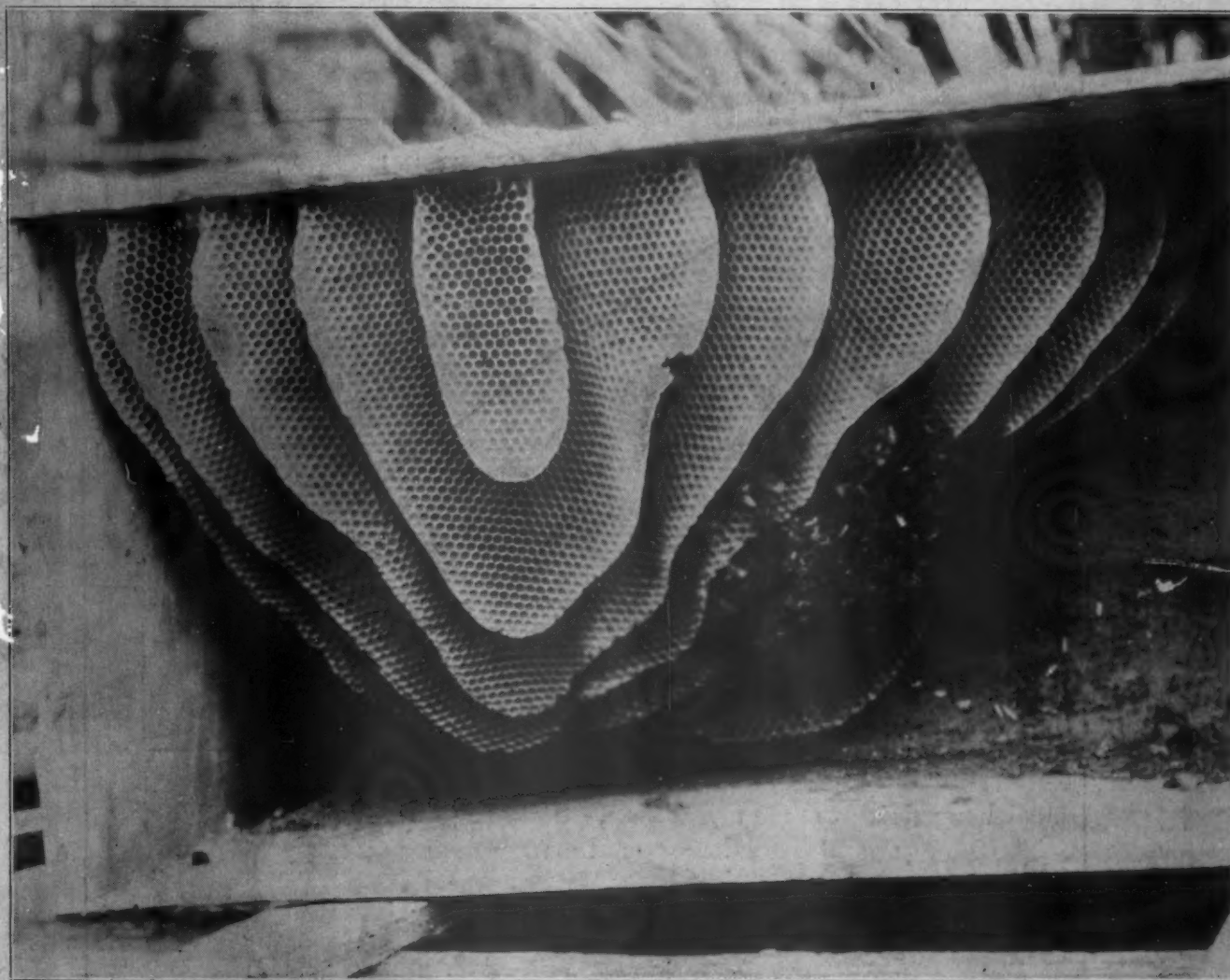


AMERICAN BEE JOURNAL

FEBRUARY, 1923



COMB BUILT WITHOUT FOUNDATION SHOWING NATURAL WAVE

IN THIS NUMBER:

HONEY REGIONS OF MINNESOTA—By Francis Jager.

SOILS AND PLANTS—By John H. Lovell.

FLIGHT STUDIES OF THE HONEYBEE—By Wallace Park.

NEW TREATMENT FOR AMERICAN FOULBROOD—By H. F. Wilson.

OUR "SURPRISE" 1923 BEE SUPPLY CATALOG

is now in the mail. Send us a list of your
requirements

WE SAVE YOU MONEY

MUTH COMB FOUNDATION

MEDIUM BROOD—5-lb. 65c; 50-lb. 60c lb.

Seven sheets to pound

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Twenty-eight sheets to pound

HOFFMAN FRAMES

100 Hoffman Standard Brood Frames	\$5.90
5 10-frame 1-story Metal Cover Hives, Comp.	15.75
5 10-frame Bodies with frames (Hoffman)	6.95
5 10-frame No. 1 Comb Honey Supers (complete without Sections)	4.75
MUTH IDEAL BEE VEIL, postpaid in U. S.90

Other prices in same proportion. Send us your name for catalog,
and our other special money saving offerings

THE FRED W. MUTH CO.

"The Busy Bee Men"

PEARL AND WALNUT, CINCINNATI, O.

FOR GREATER SUCCESS YOU SHOULD BUY

WOODMAN INNER OVERCOAT HIVES

Protected Bees Work Day and Night. It has been shown by careful observation that maintaining a temperature of 98 degrees permits comb building to go on both day and night. The bees will thus devote more daylight time to gathering honey.

Larger Honey Crops Are Assured. The bees are enabled to rear brood earlier in the spring, with no danger of chilled brood on account of cold snaps. One bee in March is worth one hundred in July. The early bees produce the early swarms, that get the large honey crops. Therein lies success or failure.

You will Practically Eliminate Winter Losses. With your colonies in normal condition (that is, with plenty of good stores, a young queen and young bees), you will be able to winter practically 100%.

The Inner Overcoat Hive will Last a Lifetime, as the outer hive walls are the same thickness as in the single-wall hive. In other words, Woodman Inner Overcoat Hives are a lifetime investment—not an expense.

Out-of-Door Wintered Bees Have Many Advantages over cellar-wintered bees. They do not spring-dwindle, and are stronger at the opening of honey flow.

Insures Close-up Protection. A person may have any amount of blankets fastened up to the wall of his room and still freeze to death if left in the center of the room without close-up protection or insulation. The close-up protection in the Inner Overcoat Hive is what does the trick.

Five one-story regular depth hives, \$25; Jumbo depth, \$27.50.

SPECIAL circular on Woodman's Protection Inner Overcoat, showing ten large illustrations, sent on request.

**A. G.
WOODMAN
COMPANY**

240 Scribner Ave. N. W.

SOLE MAKERS

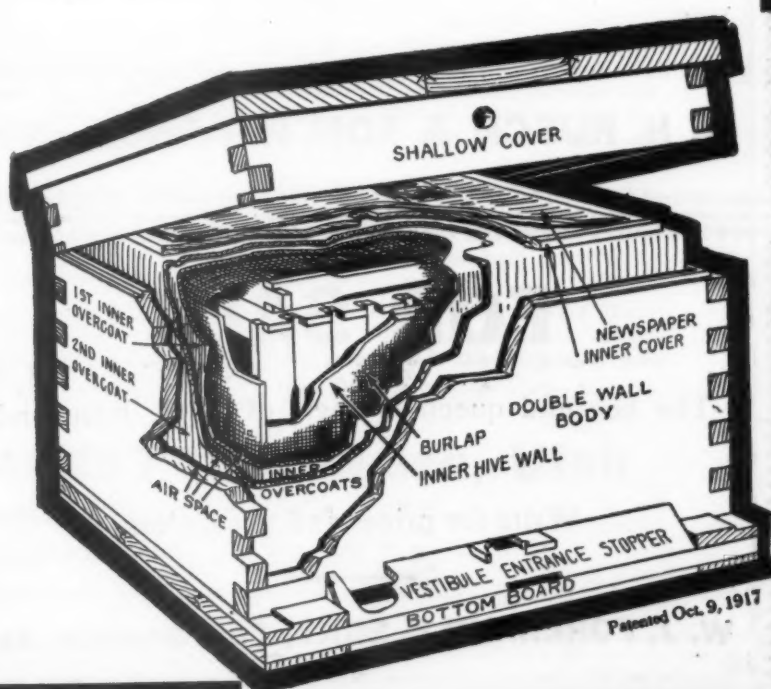
GRAND RAPIDS, MICH.

U. S. A.

HOW TO USE

PROTECTION HIVES

When the bees are to be prepared for winter, remove the cleats which close up the insulating space. Then telescope one or more bottomless corrugated paper box insulators between inner and outer hive walls. Spread a piece of burlap or sacking material over the hive so that it will be carried down with the Inner Overcoats in telescoping them over the inner hive wall, having the effect of wrapping the brood nest in a blanket. These Inner Overcoats, with their air spaces, afford more protection than several inches of ordinary packing materials, and this is all secured in an insulating space of about one inch.



Here Is Your Chance

From factory to you, our excellent made material at attractive prices. Send in a list of your needs of BEE SUPPLIES for the coming season and get quotations on it.

Langstroth portico 8 and 10-frame hives and supers, also 8 and 10-frame 4x5 comb-honey supers at cost prices while they last.

CHARLES MONDENG

146 Newton Ave. N. and 159 Cedar Lake Road

MINNEAPOLIS, MINN.

BEE SUPPLIES THAT ARE MADE TO SATISFY

Send us your orders for your 1923 requirements now.

SPECIAL PRICES ON SECTIONS:

50,000 4¼x4¼x1½ plain No. 2\$7.00 per 1000
25,000 4¼x4¼x1¼ Beeway No. 2\$8.50 per 1000

We guarantee the above to be first-class in workmanship and material.

Write for our new 1923 catalog showing full line of bee supplies.

A. H. RUSCH & SON, Reedsville, Wis.

FOR SALE

The bee and queen business of W. J. Forehand
& Sons

Write for prices and particulars

W. J. FOREHAND & SONS, Fort Deposit, Ala.

CONTENTS OF THIS NUMBER

Honey Regions of Minnesota—	Francis Jager	63
Editorials		66-67
Soils and Plants—John H. Lovell		68
Flight Studies of the Honeybee—	Wallace Park	71
Review of Bulletin on Dissemina-	tion of Fire Blight—Dr. J. A. Merrill	72
New Treatment for American	Foulbrood	73
Non-Freezing Solution		73
Bees in a Greenhouse—C. P. Da-	dant	74
Vision of the Bee—J. H. Lovell		74
Caucasian Mountain Bee—C. A. Gorbacheff		75
Wax Secretion—Dr. Brunnich		75
Remarks on Queen Breeding—	John Protheroe	76
Sow Thistle as a Honey Plant—	Frank C. Pellett	77
Educating People to Use More	Honey—Frank V. Faulhaber	78
The Huber Letters		79
Spread for Bread—John T. Bart-	lett	80
Getting Publicity for Beekeeping	Robert S. Merrill	81
Does Beekeeping Pay?—H. Pear-	son	81
Two of Uncle Sam's Apiculturists	—G. H. Cale	82
Feed in Winter—F. B. Paddock		82
Nehalem Beeswax		83
How Bees Convey Location of Nec-	tar—A. R. Graham	84
Review of German Publication—	G. E. King	84
Beekeepers by the Way		84
Taking Swarms from Chimney—	Peter Petersen	85
Scabs in Selling Honey—R. Die-	mer	85
Honey in Auto Radiators		85
Bees Extraordinary—Albery R.	Rice	85
Editor's Answers		86-87
Odds and Ends		87-88

Brookside Apiaries

If it's more than ordinary queens you want, write us about our new Italian-Carniolan 1st cross strain. We will have full colonies at \$10. Write for particulars.

O. E. TIMM, Prop.
Bennington, Nebraska.

YORK'S BEES and HONEY

GEO. W. YORK, Editor,
906 W. First Ave., Spokane, Wash.
A 16-page monthly, at \$1 a year—devoted exclusively to bee culture. It's different from the other bee-papers. Better order it for a year, beginning with the January number. You'll like it. Sample copy free.

MONEY AND SATISFACTION FOR YOU

Save one profit by buying direct from factory. Standard, Jumbo and Modified Dadant Hives; cedar or pine. Write for catalog.

A. E. BURDICK, CO.
Sunnyside, Wash.

Honey Mixture for Autos

I have had a pop bottle filled with water and honey (50-50) sitting outside on an empty beehive since about the first of December. The temperature has ranged from 40 above to 20 below zero, F. It did not freeze. The mixture became very thick at about zero temperature, but not so thick at any time as to prevent one from pushing a stiff straw clear to the bottom of the bottle, the same as though it was cold, thick honey.

J. T. Starkey,
Minnesota.

Cornell Short Course

From February 20 to 23 will be held a four-day short course in bee culture

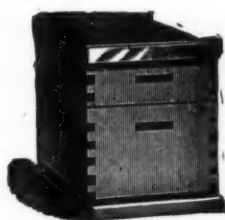
at Cornell University, Ithaca, New York. The lectures will be given by Dr. Phillips, George Demuth, George Rea, R. B. Willson, G. A. Everett, Bristow Adams, A. R. Mann, R. P. Sibley, O. A. Johannsen and Anna B. Comstock. All interested in beekeeping are invited to attend.

More Beekeeping Teachers

It is pleasing to note the advance of work in beekeeping at the Agricultural Colleges. Word has recently reached us of the appointment of D. B. Brown, of Kansas, to assist Prof. H. A. Scullen at the Oregon College of Agriculture, and J. C. Kremer to assist Prof. Russell H. Kelty at the Michigan College.

Using Honey Instead of Sugar

Scarcity and high cost of sugar in Germany has greatly increased the demand for honey. In spite of this, however, the domestic supply has decreased, says Consul Dumont, Frankfurt-on-the-Main, in a report to the Department of Commerce. In Hessen Nassau the total number of hives in 1921 amounted to 50,585. The best quality of strained honey from the vicinity of Cassel retails at Frankfurt at 300 marks per pound, or about 6½ cents. This is light-colored honey, made chiefly from early flowers and tree blossoms. Another kind which is also greatly prized for its flavor is the darker-colored "Heide" or heath honey.

**MR. BEEKEEPER—**

We have a large plant especially equipped to manufacture the supplies that you use. We guarantee all materials and workmanship. We ship anywhere. We allow early order discounts and make prompt shipments. *Write for free illustrated catalog today*

We pay highest cash and trade prices for beeswax

LEAHY MFG. CO., 90 Sixth Street, Higginsville, Missouri

J. W. ROUSE, Mexico, Missouri Texas Distributors, A. M. HUNT & SONS, Goldthwaite, Texas

**SUPERIOR
SERVICE
SAVES**

**TINKERING
TEMPER
TIME**

Why TINKER trying to make bee hives, losing your TEMPER and Time when SUPERIOR is at your SERVICE and will SAVE you time and money in the end?

This is an age of specialization and a period of saving. Don't try to save a few pennies now at the expense of dollars later on. More time and money will be lost in manipulating the hive in the apiary on account of mis-fitting parts than can ever be saved in making hives and parts at home.

We specialize in the manufacture of beehives and comb foundation. Our equipment consists of only the best machines and we employ capable operators to run them. Thousands of dollars have been expended by us in designing and building a set of wholly automatic frame-making machines, with the result that we are now turning out the best constructed Hoffman frame in the market today. It's a fact, and we invite comparison.

You simply can't go wrong if you use SUPERIOR foundation. Virtually 100 per cent Western beeswax is used and it is made by the famous WEED PROCESS, thus assuring superiority in color and texture as well as in tensile strength. Our best ad. is the beekeeper who has used it.

We'll be pleased to quote. Write us now.

SUPERIOR HONEY CO., Ogden, Utah

Manufacturers of Beekeepers' Supplies.

Branches at Idaho Falls, Idaho, and Riverside, Calif.

N. B.—Don't forget our January Ad. about the FREIGHT.

TENNESSEE-BRED QUEENS

Fifty-one Years' Experience in Queen-Rearing
Breed Three-Band Italians Only

	Nov. 1 to June 1			June 1 to July 1			July 1 to Nov. 1		
	1	6	12	1	6	12	1	6	12
Untested.....	\$2 00	\$ 8 50	\$15 00	\$1 50	\$ 7 50	\$13 50	\$1 25	\$ 6 50	\$11 50
Select Untested.....	2 25	9 50	18 00	1 75	9 00	16 00	1 50	7 50	13 50
Tested.....	3 00	16 50	30 00	2 50	12 00	22 00	2 00	10 50	18 50
Select Tested.....	3 50	19 50	35 00	3 00	16 50	30 00	2 75	15 00	27 00

Select tested, for breeding, \$7.50.

The very best queen, tested for breeding, \$15.

Capacity of yard, 6,000. I sell no bees by the pound or nuclei, except with high-priced tested and breeding queens.

Queens for export will be carefully packed in long-distance cages, but safe delivery is not guaranteed.

JOHN M. DAVIS, Spring Hill, Tenn.

The Season's Greetings—

WHY—WHEN—WHERE

WHY—You should get your name on our mailing list; it means service to you throughout the year of 1923.

WHEN—Now is the time; a post card with your name and address will bring our Bee Supply Catalog to you.

WHERE—Service in every sense of the word is yours.

AUGUST LOTZ COMPANY, Boyd, Wisconsin

BEES Bred for Honey Gathering QUEENS

My bees are **Moore-Howe** strain, bred from select mothers chosen from my 1,000 colonies with special reference to honey-gathering, white capping, uniformity of color and gentleness.

First premiums for the last five years at fairs in my section on queens and nuclei.

Prices for April and May:

3-frame nucleus with untested Italian queen ----- \$5.00

1 untested queen, \$1, 25 or more, 90c each.

Tested queens, \$1.50 each; 25 or more, \$1.40 each.

I guarantee a square deal.

JOHN W. CASH, Bogart, Ga.

Mary Elizabeth Paddock

The arrival of Miss Mary Elizabeth, weight 8 pounds, at the home of Prof. F. B. Paddock, of Ames, Ia., has recently been announced.

Montana Short Course

The Montana short course in beekeeping held during Farmers' Week, at the Agricultural College at Bozemann, was well attended and from every standpoint was one of the best ever held in Montana. O. A. Sippel and State Entomologist R. A. Cooley had the work in charge, assisted by B. F. Smith, Jr., J. F. Pithoud and Mr. Thorp. The course lasted for five days and covered the field of beekeeping as fully as was possible in the limited time.

Queens for 1923

Pure Three-band Italians that deliver the honey.

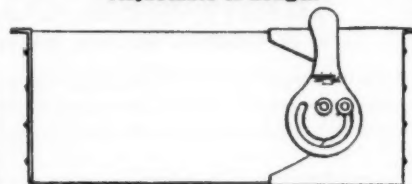
YOUR ORDERS SOLICITED

Untested ----- \$1.00 each
Tested ----- 2.00 each

NO DISEASE

D. W. HOWELL, Shellman, Ga.

The Bowers Adjustable Division Board Adjustable to Length



Patented June 27, 1922.

Makes a quick, easy way to provide close-up protection so necessary during early spring, when brood-rearing must progress rapidly if best possible results are to be secured. Circulars, prices on request.

F. D. BOWERS,
Sugar Grove, Pa.

QUEENS-OVER 100,00-QUEENS

Reared by our breeder. Who bought them? Beekeepers who wanted a good strain of honey gathering 3 banded Italian bees. Give our queens a trial and be convinced. Everything guaranteed free from disease and to please our customers. Delivery starts April 1. Orders booked now at our reduced price.

Untested.

1 queen ----- \$ 1.00
12 queens ----- 10.00
100 queens ----- 75.00
1000 queens ----- 700.00

Tested

1 queen ----- \$ 1.50
12 queens ----- 17.00

Good breeders, \$5.00 each.

Write for prices on bees.

THE CITRONELLE APIARIES
CITRONELLE, ALA.

A SUPERIOR QUALITY
AT LESS COST

SUPPLIES

A SUPERIOR QUALITY
AT LESS COST

(MADE BY THE DIAMOND MATCH CO.)

To Our Beekeeper Friends:

You will notice we have used a slogan at the top of our advertisement "A superior quality at less cost." We are not given to making extravagant statements and this slogan means exactly what it says. Many of our Beekeeper Friends have written us telling us what they think of our merchandise, and we are going to print a few of the many complementary letters received.

Hoffman & Hauck, Inc.,
Woodhaven, N. Y.

Dear Sirs: In regard to your letter, will say that I am recommending you as an A-1 Company to do business with. Your hives, frames and everything in the bee accessories I ever received from you have been up to standard, and of the best material that can be produced; also milling first-class, and will say I have been treated as a gentleman.

And as far as prices are concerned, you are the most reasonable of any dealers in Bee Supplies.

A. H. HOLBROOK,
153 Darrow St., Quincy, Mass.

OUR 1923 FOUNDATION PRICES:

	5 lbs.	10 lbs.	25 lbs.	50 lbs.
Medium Brood	64c	63c	62c	61c
Thin Super	71c	70c	69c	68c

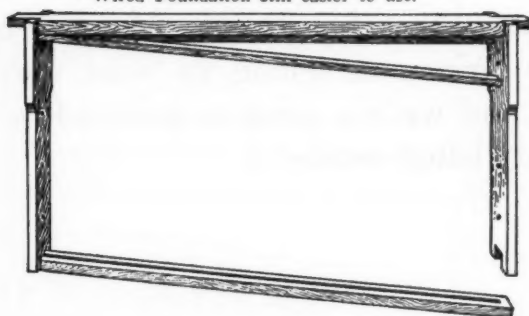
HOFFMAN & HAUCK, Inc., Woodhaven, N. Y.

DADANT'S WIRED FOUNDATION IS EFFICIENT

**BECAUSE
IT IS EASY TO USE**

A new style frame which makes
Wired Foundation still easier to use.

Notice thick
wedge

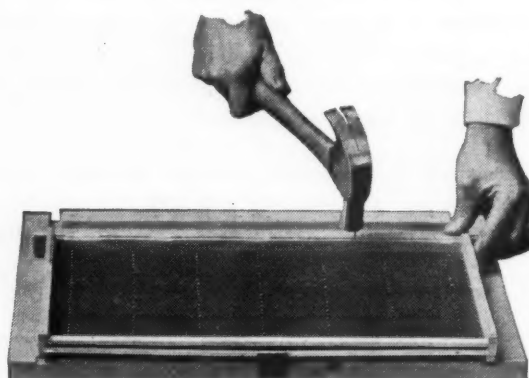


and slotted
bottombar

This frame is convenient and efficient, and, since it sells at the same price, it is superseding the old style frame

Only one operation to secure
foundation in frame.

1. Insert founda-
tion in slotted
bottombar.



2. Nail wedge
at topbar.

THIS IS EFFICIENCY IN MODERN BEEKEEPING

Wired Foundation and slotted bottombar frames are sold by all distributors of Lewis "Bee-ware" and Dadant's Foundation. Send them your orders.

DO NOT FORGET, we still make Dadant's Famous UNWIRED FOUNDATION

DADANT & SONS, HAMILTON, ILLINOIS

BEESWAX.—We constantly need pure beeswax and pay good prices. Ship to us at Hamilton, Illinois, or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your station, as you wish.

Honey Flora of Victoria

A copy of "The Honey Flora of Victoria," by F. B. Beuhne, the Government Apiarist of Victoria, has reached the editor's desk. It is an attractive paper-bound book of 150 pages and 70 fine illustrations. The flora of Victoria is very different from that of America. 120 pages of the book are given to the description of the many species of eucalyptus trees which furnish the most of the honey in that region. While eucalyptus trees are common in Cali-

fornia and to some extent in other wild parts of America, there are no plants described which are familiar in our colder regions.

The book is published by the Department of Agriculture at Melbourne, and the price is one shilling. Since Australia, of which Victoria is one of the provinces, is on the other side of the world, their summer season comes at the time of our winter and the blooming period of the trees listed comes when our bees are in their winter quarters.

enough to take the short top-bar standard frames. We use one drawn comb and two frames with full sheets of foundation, spacing them so that they do not touch. In this way the moths do not bother the combs. The entrance is a 2-inch auger hole covered with a coarse mesh screen which will pass the bees but keep out the mice, which would destroy the comb. The scouts soon find these boxes, and I have caught many prime swarms in the vicinity of Council Bluffs, where I have a small apiary.

James Bee Drury.



Buckwheat Hulls for Winter Packing

Mr. C. C. Brinton, of Bloomsburg, Pa., recently sent us a sample of sugar honey put up by the Franklin Sugar Refining Co., in Pennsylvania. This sample, which was a 16-oz. jar, was packed in buckwheat hulls. It arrived in perfect condition.

Mr. Brinton tells us that he has used these buckwheat hulls for several years as winter packing in his large four-colony cases. He says it is an excellent packing material. The hulls are light and pack closely without compressing and, best of all, they will never absorb moisture.

Suggestions

Regarding the "Value of Propolis," page 519, November Journal, Mr. H. C. Cook, of Omaha, finds a ready market for it among the harness makers at \$1 per pound. I have seen large balls of it at his place. He saves every bit of it.

For attracting wild bees, we have had fine success with trap boxes placed in the timber about the last of May until the end of July. We use an apple box which is just long

Saskatchewan Adds Bees to College Work

Newspaper reports coming to this office convey the information that Miss Ethel May Brayford has been selected to take charge of the course in beekeeping, lately added at the University of Saskatchewan.

First Strawberries of the Season on Market

A recent report from New York indicates that the first Florida strawberries have arrived there and are selling for \$3 per quart.

The first quart harvested in Texas was raffled off and the proceeds given to the Red Cross. This quart brought \$25.

The Honey Crop in San Diego County, California

The San Diego County honey crop this year is estimated at 80 carloads of twenty tons each, or about one-fourth of the state's production. This season marked one of the best honey flows ever experienced in the county. The beekeepers extracted two and three cases of honey per colony.

PACKAGE BEES FOR 1923

Three-band Italians only bred for business. A 2-pound package of the MOSES hustlers with a select untested Queen, \$3.75, \$5 to 100 packages \$3.50; 10 per cent books your order. Safe arrival and satisfaction GUARANTEED ON EVERY PACKAGE AND QUEEN SHIPPED.

Order now for spring delivery, and make sure of shipping date. I do not accept more orders than I can fill promptly.

W. H. MOSES, Lane City, Texas, U. S. A.



Best Poultry Paper

Showing Champions in all Breeds and Full Page Art Chicken Pictures, natural colors, suitable for framing, FREE with several issues during year.

3 Months' Trial 15c

US 1c stamps accepted. Monthly 80 to 120 pages. Practical articles by foremost poultrymen. 1 yr. \$1; 2 yrs. \$1.50; 3 yrs. \$2. Poultry Tribune, Dept. 6, Mt. Morris, Ill.

MONEY SAVED

BEE SUPPLIES

TIME SAVED

Roots goods at factory prices with WEBER'S Service

Send us a list of your wants and we will quote prices that will save you money

C. H. W. WEBER & CO., 2163-65-67 Central Ave., Cincinnati, O.

 49 YEARS FOR PROGRESS IN BEEKEEPING—No. 2

THE MEN

Behind Lewis Beeware—

WHERE would beekeeping in America be today without the men who have stood with the G. B. Lewis Company during its 49 years of constructive work for beekeeping?

We are content to have Lewis Beeware and Lewis Service judged by the honored names that have always been associated with ours as distributors and users of our supplies.

Typical Distributors

Frank Rauchfuss of the Colorado Honey Producers Association, father of comb honey grading.

E. G. LeSturgeon—Texas Honey Producers Association, pioneer in better honey marketing.

B. F. Smith, Ex-President Montana Honey Producers Association.

W. P. Southworth of the Western Honey Producers, Sioux City, Iowa.

Dadant and Sons, Hamilton, Illinois—the best known name wherever beekeeping and improved hives are known—in North America,

South America, Germany, France, Russia, Italy; publishers American Bee Journal.

A. G. Woodman—Michigan, who made possible international distribution of the Bingham smoker.

Geo. Markle—Ontario, inventor of the Lewis Markle power extractor—

And over 200 branches and dealers throughout North America, now holding ample supplies of Lewis Quality Beeware at central shipping points in nearly every state for your convenience in ordering this Spring.



If you do not receive by March first our February "Beeware" on "How To Use Equipment For Maximum Results," write for your copy. Sent postpaid anywhere in North America, with 1923 Lewis catalog and name of nearest Beeware supplier—free.



Forty-nine years constructive work in beekeeping, with the loyal co-operation of such men as these, has made the Lewis Beeware catalog for 1923 not only the most complete and up-to-date book of its kind but the most reliable. It will keep you in touch with the newest profit making ideas and methods of leading beekeepers; and will help you select the quality equipment that will pay you the largest profits. Write for it.

LEWIS BEEWARE

G. B. LEWIS COMPANY

Home Office and Works—Watertown, Wisconsin, U. S. A.

BRANCHES—ALBANY, N. Y. LYNCHBURG, VA. MEMPHIS, TENN. WICHITA, KAN.
OVER 200 DEALERS THROUGHOUT NORTH AMERICA



VOL. LXIII—NO. 2

HAMILTON, ILL., FEBRUARY, 1923

MONTHLY, \$1.50 A YEAR

HONEY REGIONS OF MINNESOTA ✓

By Francis Jager, University of Minnesota

MINNESOTA, the North Star State, the land of ten thousand lakes, must be seen to be appreciated.

The surface of Minnesota is level on the prairies and undulating to hilly in the rest of the state. Her rivers and creeks have eroded beautiful valleys and canyons through which flow innumerable creeks surrounded by cliffs and dells.

Numerous railroads and beautiful highways reach every town and section of the state.

The soil of Minnesota is a rich black loam with a yellow or blue clay subsoil. It is derived from the great glacier which passed over the state thousands of years ago, which, in melting, left a cover a hundred and more feet thick of lime containing strata over the original rough surface of granite and limestone. Upon disintegration of the glacial deposits a soil was produced which for fertility has no superior in the United States. Geologists may still read the handwriting of the glacier in the great round granite boulders and moraines which successfully resisted disintegration, in the great furrows which these giant boulders plowed into the original limestone surface in their irresistible southern motion. Higher levels like the southeastern part of the state near Winona, still bear the original character of Minnesota because the great glacial passed around them. Limestone caverns and cave-ins, sink holes, and romantic scenery indicate what Minnesota could be but for her icy visitor from the north.

Occasional sandy stretches are found in some parts of the state where her ancient rivers have abandoned their original beds for others more comfortable.

Minnesota is the continental divide

of the United States, its rivers flow into the Arctic Ocean, Atlantic Ocean, and the Gulf of Mexico.

Her woods and fields are ever green because rainfall is just right.

Her winters are moderate and healthy, but for a day of blizzard and cold now and then for a change.

She has the farthest inland ocean port on the continent, and her Atlantic harbor at Duluth may become a rival of New York. She is also accessible to water navigation from New Orleans and the Gulf of Mexico as far as Minneapolis.

Her waterways are so admirable that you may circumnavigate the whole state along the boundary lines in a boat or canoe.

She produces, on her iron Range, two-thirds of the iron for the steel industries of the United States.

Her lumber has built Chicago, St. Louis and a score of other cities in the United States.

In wheat, corn, barley, oats, rye, potatoes and flax production she ranks among the first six states in the Union.

Her water power is immense. A natural cataclysm has lifted up her surface like an immense bubble, through which molten iron has inundated the valleys. The slopes of this bubble are now embellished by rapids and waterfalls which supply the state with white coal. An extinct volcano, near Taylor Falls, indicates



Mrs. McCabe's attractive apiary in the city of St. Paul.

that she must have been a very lively state in her younger days.

Her lakes, with thousands of islands, are filled with choicest fish, and the woods surrounding them abound in all kinds of game, from pheasant and wild chicken to bear and moose.

For beekeeping, Minnesota has been divided into three parts. First the region of deciduous trees, or the "Big Woods," in the southeast part of the state. This section has once been covered by a dense growth of elms, basswoods, and sugar maples, with a few other scattered varieties.

The ax of the early settler has cleaned the majestic forests to make room for pastures and farm crops, but the forest is still waging a losing fight. Beautiful hardwood groves exist on every farm to this very day.

Second, the coniferous region, or the "Cut-over Lands," of Minnesota comprise the whole northeastern half of the state. This country, but 50 years ago, was the home of the white pine. Human greed has laid its hand on this primeval forest and has left behind it nothing but devastation, stumps and ashes. Slashings left be-

hind caught fire and forest fires were raging year after year, and still are destroying what little vegetation was left. Many cities and towns are burned, and hundreds of human victims are sacrificed every year on the altar of the lumber king. A few hundred miles of this magnificent forest the state has wisely appropriated and made of it our Itaska Park, that the future generations may know what their forefathers have given away for a pot of porridge. In the wake of the fires a new vegetation springs up, and raspberry, cherry, alsike, fireweed, goldenrod and aster substitute a beauty of their own for the past grandeur which the blackened stumps in their midst suggest.

The third section of the state consists of the western prairie lands, which the forest, advancing west from Lake Superior, was unable to conquer in the battle of ten thousand years. Placid and level they lay in the clear sunshine. They were the grazing fields of the buffalo, and the majestic display of prairie fires. Here the Indians gathered from every corner of the country to smoke

the pipe of peace at the Pipestone quarries to which they made pilgrimages for the precious red stone. Now the country is dotted with beautiful farm houses in the midst of planted groves; pure-bred cattle graze in the clover fields; wonderful roads cross the country, and the once wild prairie has become a place of high civilization, wealth and prosperity. Sweet clover, alsike, white clover and asters abound wherever grains and corn do not dispute their spread.

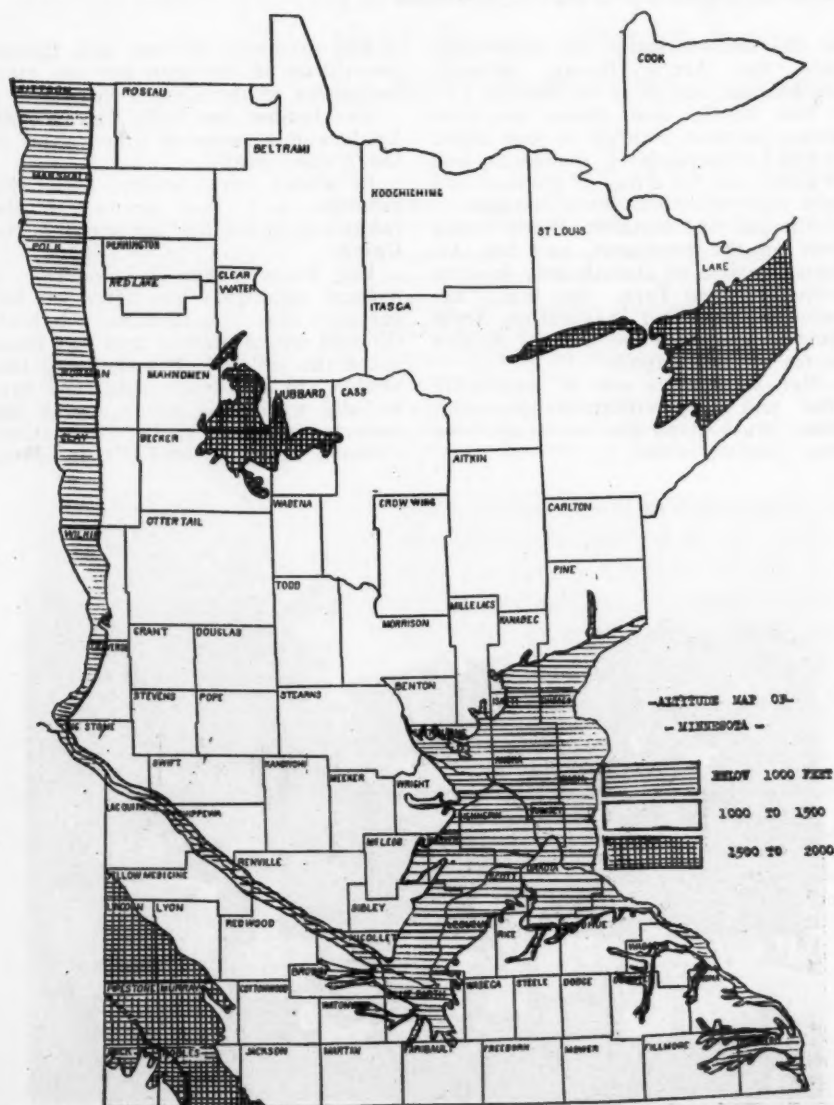
These three sections are rather sharply defined and differ from each other as night and day, giving the most fastidious land seeker ample choice to locate.

Basswood and elm have sent their fingers along the creeks and river bottoms into the prairie lands and to some extent also into the pine lands. North of Lake Superior there is an island of basswood in the midst of pine several hundred square miles in extent. (See Geographic Magazine).

It is time for me now to say something about beekeeping in Minnesota. The Big Woods are now dotted with big cities and thriving villages and beekeepers are plentiful. From white clover, alsike, sweet clover, basswood, elm, fruit trees, berries, dandelion, goldenrod and aster, 100 pounds of surplus honey average may be reasonably expected from each colony. The honey flow begins about June 15 with clovers, reaches its maximum the first ten days of July, when basswood commences to bloom, and it ends about July 25, when the clovers cease yielding honey. The beekeeper's harvest follows immediately, allowing the bees to fill up for the winter on goldenrod and aster. For brood stimulation, in spring, there is always a strong and continuous flow, beginning April 1, from soft maple, willow, sugar maple, elm, fruit trees and dandelion. The bees breed fast and strong. Between dandelion and clover there is sometimes a hiatus of about ten days, but usually the flows run into each other. The fall is usually warm, and the lakes do not freeze over until about Thanksgiving. The bees are put into wintering cellars in November for their four months' winter sleep.

The swarming season lasts from June 1 to July 1, and is more pronounced in some seasons than in others. The honey flow also varies in different seasons from three to eight weeks. It is very intense, in some years amounting to 20 pounds of nectar per colony per day; in other seasons the maximum may not exceed 5 pounds. The honey is white with a greenish or yellowish tinge; depending upon the amount of basswood and other nectar mixed with clover. If extracted before basswood bloom, the clover honey is almost water white.

The honey harvest also depends on the weather. On an average, two days in a week will be cloudy or rainy, when bees cannot work. The temperatures, however, are right, usually above 80 degrees, and the air does not cool off very much during



Map showing altitude of Minnesota. It will be seen that but a small part of the state is below 1,000 feet above sea level.

the night while the honey flow is on.

The Big Woods bee locations are well taken, but the prospective beekeeper may easily buy out some beekeeper and his location. A great advantage of this section is the proximity of the "Twin Cities," St. Paul and Minneapolis, with nearly one million inhabitants, where a ready market can be found for the honey near home. Many other towns of three to fifteen thousand inhabitants in this section absorb more honey than the locality can produce. This section also forms an outlet for Wisconsin, where there are many big beekeepers, but few towns of any size.

The cut-over lands of northeast Minnesota are the richest of the three sections in possibilities of honey production. It is true, spring in this section, on account of proximity to Lake Superior, opens rather late, but the honey flow is more intense when it does come. This country is sparsely settled, except on the Iron Range. Duluth and the Iron Range, with their mining population of wholesale honey eaters are the market places of this section. There are small towns located near the railroads, primitive towns, with piles of fence posts and second-crop logs waiting for an occasional train to take them away. Settlers are few and far between, and the practical log cabin, with its little vegetable garden around it, and its dairy herd, foretells that the soil that was able to produce the giant white pine will, in no distant future, produce giant turnips, cabbages, potatoes, cattle and pigs. The soil in the cut-over lands is very rich in lime, and clovers naturally spring up wherever they get a chance. I have walked through alsike clover four feet high (do not say "fish story"). You cannot see the legs of deer grazing in red clover. Alsike grows wild along the roads, railroad embankments, among the stumps, in every nook and corner. It blooms profusely and the air is laden with its sweet fragrance. This country is the home of alsike. For three years after a forest fire, fireweed dominates the field. As far as the eye can reach, in June and July, the hillside and valley are one purple carpet. Raspberry chokes the fireweed in a few years, and in turn it is choked by the cherry and other underbrush. Alsike fights all of these for its existence and does not give up until the growing underbrush has deprived it of sunlight.

Where underbrush does not come up very thick, or where the ever-growing sheep and dairy industry keep the underbrush in control, alsike is king. The ever present black, white pine stump, which never decays, may keep this country indefinitely from grain and corn raising, but for dairying the country cannot be surpassed. The land is undulating, with some marshes and some stony hills, but the soil is rich, although sandy in places. To settlers it may be said: Put plenty of cattle on your land they can graze around stumps, and place bee-

hives on the stumps and you can make a good living.

This brings me to bees in this section. It is not unusual to harvest 200 pounds of honey from a colony. The honey in this section is water-white from fireweed and clover. Sometimes it shows some yellow-greenish color. It is of fine body and flavor. The season lasts from June to the end of August. The nights are cooler than farther south.

There are practically no beekeepers in this section except in a few towns like International Falls, Duluth and around the Iron Range. There is room for thousands of professional beekeepers. A man may keep bees there without danger of foulbrood from his neighbor.

You may still travel in this section a hundred miles without seeing a human being, or you may go to Duluth or the Iron Range and believe you are in Pittsburg. This land would be ideal for a man with many outapiaries who would produce honey by the carload for export to trade centers. The Chamber of Commerce of Duluth will gladly furnish prospective settlers with authentic information about land and prices. For \$15 an acre, a man may buy some good land, but beware of sharks. The Mississippi River and St. Louis River call the cut-over lands of Minnesota their cradle.

The prairie lands are called the Bread Basket of the world. The Red River of the North, and the Minneso-

ta River traverse this section from south to north, and from north to south. There are some beekeepers in that section near towns. The Red River Valley is abundant in sweet clover. Thousands of acres of sweet clover are raised for seed. There are not many beekeepers in Red River Valley. The honey crop in the prairies averages from 50 to 150 pounds per colony, depending mostly on sweet clover. In the fall of the year asters bloom profusely, and I have seen a colony of bees in Wheaton, Traverse County, fill one super with aster honey in the last half of September. The land on the prairie is very dear, \$200 to \$400 per acre. The absence of hills, woods and windbreaks makes the winds very uncomfortable, and beekeepers always plant willow or evergreen windbreaks for their bees.

Minnesota, with her lake-dotted and island-studded beauty, is attracting thousands of tourists to the state each year.

Minnesota, with her iron, lumber and waterpower, is attracting the biggest industries to locate in her midst.

Minnesota state foulbrood inspection, aided by a model "Foulbrood Inspection Law," has reduced foulbrood diseases in the state to where they cease to be a menace.

Minnesota, with her 20,000,000 pounds of finest honey unharvested, may at no distant date be one of the leading honey states in the Union.



Map showing natural regions and rainfall of Minnesota.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language.
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THE EDITORS' VIEWPOINTS

TRAVELING EXHIBITS

For the information of the public, the Central Beekeepers' Association of France has organized, with the help of other associations and of the Paris-Orleans Railroad Company, traveling exhibits of bee culture. These exhibits will stop at different large towns, on Fair days, in order to enable the farmers of the country to become acquainted with the implements and methods. A first list of stops is published in *L'Apiculteur*.

ADVERTISING FOR CATALOGS

In some European magazines, beekeepers desiring to secure the catalogs of the different manufacturers advertise for them in the "Special Notices." This saves them the trouble of writing to each and probably secures catalogs of makers who do not advertise. A novel way.

NEHALEM WAX

Our readers will find, in the present number, an article on this subject. It is said that one or more ships, loaded with beeswax, from Spain, or from Africa, or Japan, were wrecked opposite Nehalem, in past ages, and that the beeswax floats to shore from time to time.

We had occasion to secure some of this wax as far back as twenty years or so ago, and although it is quite similar to beeswax, it differs sufficiently from it to be detected. Whether it is through mistakes or through collusion by interested parties, some of the scientists who have examined samples are holding that it is pure beeswax. But the story of ships loaded with beeswax having been sunk there in past centuries is too absurd for acceptance. It is evidently some sort of mineral wax, similar to what is called ozocerite or ozokerite.

OVERLOADING CONVENTIONS

One of the most active delegates of the International meeting at Marseilles writes us that the greatest fault with that convention was its being so overloaded with addresses that there was little or no time for discussions.

This is one of the greatest faults of conventions of beekeepers. It is almost as bad as a shortage of addresses. When Dr. Miller was in his best days, he often presided at meetings, and I heard him remark that the best part of a meeting was the discussions that followed the reading of a paper. Nowadays, beekeepers are too prone to accept the statements of the leaders as gospel truth. In those days, the discussions brought out new facts and when Dr. Miller presided he would even allow the discussions to swerve from the main subject "from the question," as long as it interested the meeting and as long as there were no personalities or bitterness injected into the debate. Since we are soon to have a meeting of the National, where we may hope to see many leading beekeepers, I suggest that the number of papers presented be limited so as to permit of discussions.

By the way, I believe beekeepers should be urged to attend the St. Louis meeting. There are to be both business sessions and educative sessions and there is not a single

one among us who is so wise as to be sure that he cannot learn anything there. Besides, think of the pleasure of meeting each other face to face. That alone is worth the cost of such a trip.

A NEW BEE MAGAZINE

A very modest little magazine sends us its first number, "The Welsh Bee-Keeper," of Ammanford, Wales. Though small, it is very nicely printed; but to us it has one great object, a page and a half evidently in Welsh or Cymric. It will please our Welsh friends, but for us it is an addition to the Tower of Babel confusion which already gives us so much extra work to understand our brothers of foreign countries.

AN EMINENT PROFESSOR

We are in receipt of a letter from the well-known Alois Alphonsus, Liebiggasse 5, Vienna I, Austria, stating that the strained circumstances in which the Austrian Government finds itself is compelling the discharge of 100,000 officials, and that the Beekeeping Department of which he is the expert, was to be discontinued January first. Dr. Alphonsus is soliciting employment either as an expert or as a bee-master. He writes a very good letter in English and offers to come to America without his family if he can find employment: "Payment according to the result." We do not have a position open just now. But among our numerous Agricultural Colleges, surely one or two may be able to offer him a job. Such men are valuable in the countries that adopt them. We already secured a position last year for Will Brunnich, son of Dr. Brunnich, and he is "making good" as an expert in dairy inspection.

COLOR OF ITALIANS

A writer in the British Bee Journal, December 14, writes: "I have noticed all my Italians were darker this year, or not nearly so bright as in the spring. This goes to prove that drones must have an equal, if not predominant power, of reproducing their particular kind."

We have often noticed that the Italian bees were darker in some seasons than in others. Charles Dadant held that the color of the honey which they have in their honey-sack has something to do with the bright color of the rings on account of their transparency. He fed honey blackened with a small quantity of ink, to a yellow bee and found it changed the color of the rings perceptibly. Perhaps this has as much to do with the darker color of bees at times, as the influence of their forebears.

THE QUEBEC PROVINCIAL MEETING

We are in receipt of a report of the Quebec meeting of November 8-9, at Montreal, with J. F. Prud'homme as president.

Over three hundred members were present. Think of that! Did we ever have more, at any meeting in the U. S.? If we did, I don't remember it.

The Association showed a balance in the bank of \$534.35.

The announcement was made that the International meeting at Quebec, in 1923, would probably be held in September, and that a number of U. S. beekeepers had already announced their intention of attending this meeting. Mr. Vaillancourt, the only man from this side of the Atlantic to attend the Marseille Congress, gave an account of his trip.

A number of addresses were delivered. Among them one by Mrs. A. O. Comire, wife of the former secretary of the Quebec association. Mrs. Comire is the president of the Circle of Farmers' Wives of the Province of Quebec.

An exhibit of honey and wax was made, with prizes distributed amounting to \$410.50.

The beekeepers of the U. S. must be fully represented at the coming International meeting next September. Canada is attractive at that time, owing to its mild climate, and there will be something for us to learn from our neighbors on the north.

The secretary of the Quebec Association is J. Armand Prud'homme, of Ste-Philomene-de-Chateauguay, Quebec. Enquiries should be sent to him.

A UNIVERSAL FRAME

The question of a universal dimension of frame, to be adopted the world over, has been discussed lately in several publications, and notably in the *British Bee Journal*. Our good friend, Mr. J. Anderson, M. A., B. Sc., of Aberdeen, in an article entitled "Hasten Slowly," takes up the subject and opposes the idea recommended by some of adopting the Langstroth hive and frame. He makes the assertion, criticised by the editor, that the Standard British frame, 14x8½ inches, was adopted without sufficient consideration. But the fact is that, although there is a standard frame in England, it has not been accepted by many leaders, and men as capable as Simmins use a frame of different size. Simmins' "commercial" frame is 10x16 inches. The W. B. C. is another size still.

But when we go to other countries, we find differences in the same way. In Germany many of the frames are deeper up and down than they are long. In addition to that, there are styles of hives which we would not adopt here, hives opening at the rear and not at the top. Yet those hives are liked by the beekeepers who use them. V. Buttel-Reepen, in an article published in the October *Bee World*, criticises our editor for saying that the German hives are not top-opening and gives a list of five different German hives which are top-opening, but he appears to sustain the desirability of the side-opening or rear-opening hives. He gives the picture of a side-opening Dathe hive, with just one super within the structure.

Most countries have varieties of hives. In France, Belgium and Switzerland, the principal hives in use are the Dadant and the DeLayens, but there are nevertheless a dozen other styles which their users consider as the best.

A very good instance of the difficulty of adopting a standard frame for the world, or even for a single country, is to be found in Mr. Anderson's article above mentioned. He dislikes fractions (so do we) and on the strength of this dislike inaugurates a Dadant frame 12 inches by 18 inches. So this is neither the regular Dadant, nor the Modified Dadant frame. But worse than this, we find that the differences in measurement systems has caused confusion and that the Dadant-Blatt frame of Europe is not the same as the so-called Modified Dadant, although they were intended to be the same, but what can you expect when half of the world uses the metric system and the other half hangs to feet, inches, ell, yards, etc.? The absence of fractions of the one gives you an increase of fractions in the other, for the same measurements, and vice-versa.

In addition to all these differences, we will always find men who will insist on inventing new styles, the less tried the more numerous. Heddon, the inventor of an invertible hive was very anxious to see the entire world come to one single size of frame, but of course that must be "Heddon." Yet that frame has all but disappeared from the apiaries.

Our conclusion is that it is out of the question to try to establish a standard frame or a universal hive. If the hive which you use gives you satisfaction and enables you to examine it from one end to the other and to supply all the wants of the bees, do not look any further, but "stick to it." The worst thing we can think of is to keep half a dozen styles of hives, in small numbers, in one apiary, for the purpose of trying them. A test on two or three hives will never give you complete evidence. It requires tests made on dozens of hives of one kind, comparatively with dozens of another kind, before you can decide knowingly between the two. Meanwhile, the possession of several different styles of hives prevents you from putting them to the best use, by supplying one needy colony with honey, pollen, brood, etc., from another colony that can spare it. I hear some of my friends, who have been suffering from foulbrood in their apiaries, shout with horror at the thought of making any exchanges. Well, friends, you will not have foulbrood all the time; I kept bees forty years without ever seeing any, and that time will come again. We must have all our hives, all our frames and our supers of one size, if we wish to make beekeeping pay. Or at least we must have not less than fifty hives of one kind, so that interchanges may be convenient. But let us not try to force a standard frame upon the world. We will never succeed.

MORE FACTS CONCERNING

MR. ALFONSUS

Professor Jager, of Minnesota, informs us that he is sending to Mr. Alfonsus a sum sufficient for him to come to America, leaving his family behind, and that he will help him until Mr. Alfonsus can find a position. Mr. Alfonsus is reported to be a very industrious worker, a good research man, a writer of international reputation, a man who *knows bees* and has large experience with them. Such men are desirable in any country. In our next number, we will give Mr. Alfonsus' portrait and a short biography. Meanwhile, those who wish to write him may address him in care of Prof. Francis Jager, College of Agriculture, St. Paul, Minn.

DEATH OF GASTON BONNIER

We have just received, indirectly, the news of the death of Professor Gaston Bonnier, member of the Academy of Science of Paris and Professor of Botany at the Sorbonne. He died in the last days of December.

Gaston Bonnier was author of a number of works on botany, especially the "Flore Complete Illustree" of France, Switzerland and Belgium. This work is not yet completely published, five volumes having been delivered and the sixth being about ready for delivery to the subscribers. The entire work was expected to be complete in about ten volumes.

Bonnier was also author, in co-operation with his brother-in-law, de Layens, of several works on bees, of which the "Cours Complet d'Apiculture" was the largest.

The writer had occasion to meet Mr. Bonnier in 1900, when the latter was President of the International Congress of Beekeepers held at Paris, during the World's Fair.

One of the most interesting works of Bonnier was his "Les Nectaires," published in 1879, when he was "Maitre de Conférences a l'Ecole Normale Supérieure" of Paris. This work, which was published in a very small number of copies, contains 8 plates, with 130 drawings. It is entirely out of print.

CO-OPERATION

Co-operation is in the air. It is talked of everywhere. The beekeepers, here and there, are organizing co-operative associations. As the meeting of the American Honey Producers' League is soon to be held at St. Louis, it is a topic of present importance.

But before we may hope to succeed in a positive and continuous manner, we must understand each other and have some confidence in one another. Let us give an instance of what we must not do:

At the Wisconsin State Beekeepers' Convention, last December, Professor Wilson, President of the American Honey Producers' League, was urging the joining together of beekeepers to secure lithographed honey pails, printed in large numbers, so as to buy them economically. One of the beekeepers present asked him: "How much rake-off do you get out of this?"

Wilson walked up to the man, put his hand on his shoulder and said: "Stand up!" Then turning to the audience he remarked:

"Ladies and gentlemen, this is the kind of men who break up co-operations and organizations of all kinds."

This is true. To succeed, we must have good men at the helm; but when they are found, we must have faith in them. Otherwise, we must return to the original individual life of "every one for himself and the devil take the hindmost." The history of the National American Association is full of incidents of this kind. But sooner or later we will overcome the obstacles.

DRONE-LAYING WORKER WITH QUEEN

The *British Bee Journal*, of December 21, contains an article describing the existence of a drone-laying worker in the same hive with a fertile queen. This is an occurrence which happens probably oftener than is generally imagined. It was noticed by Samuel Wagner and mentioned by him in the early days of the *American Bee Journal*. We have seen it several times and we believe that many an extraordinary occurrence would be explained by the hypothesis of the presence of a drone-laying worker at an unexpected time, in the hive.

SOILS AND PLANTS

A Discussion of the Various Types of Soils and the Plant Life Adapted to Each

By John H. Lovell

WHILE it is generally known that the Western States are semi-arid and the Eastern States have an abundant rainfall, few know that the soils of these two great regions, which are nearly of equal size, differ profoundly. The forces making the soils in these two areas differ widely, and as a result there is a great difference in the soils and native vegetation. The line of division extends from northwestern Minnesota southward across Nebraska, Kansas, Oklahoma and Texas. In the eastern region the average rainfall ranges from 50 to 80 inches in the eastern portion, to 20 inches in the extreme western part. In this region lime (carbonate of calcium) is not increasing but is removed by leaching as rapidly as it is formed. Not alone is lime, but all soluble salts are decreasing as the result of the abundant rains. In the Western States (except in the narrow rain belt on the Pacific Coast) lime is steadily increasing in the soil as the rocks decay. The rainfall ranges from 20 to 10 inches, or less. Many injurious salts, such as "black alkali and white alkali" also remain in the soil. When irrigation is practiced the land becomes very fertile and produces enormous crops. If the land has never been irrigated, the presence of harmful salts is seldom noticed except in low spots where water has accumulated. But after a few years of irrigation, especially in localities where water has been used excessively, alkali salts may appear at the surface of land that was formerly quite free from them. If rain or ir-

rigation is followed by hot, dry weather, they form a white crust. Capillary attraction draws the alkali to the surface, and a single season has been known to transform a flourishing alfalfa field into a barren alkali flat. This is a common experience in all irrigated regions with an arid or semi-arid climate. A few

most crops. Probably a million acres have been lost on account of alkali. Many tracts of land are now alkali flats or salt-grass pastures, which were formerly in a high state of tillage. (See map).

Alkali Salts

The harmful salts which occur in such large quantities in western soils are properly known as black alkali and white alkali. The most injurious of these substances to vegetation is black alkali (sodium carbonate) also called sal soda and washing soda, which is corrosive in its action upon plants. The presence of more than one-tenth of 1 per cent of black alkali will practically prevent the cultivation of all crops; and this salt is, therefore, the most dreaded by farm-



Soil Regions of the United States: 1. Eastern region with an annual rainfall ranging from 80 to 20 inches. Lime and the soluble salts derived from the decay of rocks are not accumulating in this region. 2. Western semi-arid region with rainfall ranging from 20 to 10 inches. Lime and the injurious alkali salts are accumulating in this region. 3. Rain belt of the Pacific Coast with rainfall ranging from 25 to 100 inches.

years ago it was estimated that 10 per cent of western irrigated land contains so much alkali as to be practically unfit for the cultivation of

ers. It is so-called because it usually colors the surface of the ground black, but this is not always the case. Fortunately, black alkali is much less common than the less injurious white alkali.

White alkali includes a group of salts, as common salt (sodium chloride), Glauber's salt (sodium sulphate), widely used as a cathartic, and baking soda (sodium bicarbonate). These salts always produce a white incrustation on the surface of the soil.

There are large areas in the west in which common salt is the most abundant alkali; in other regions, especially east of the Rocky Mountains, Glauber's salt forms the larger part of the alkali. While white alkali is injurious to vegetation, it is not corrosive; but crops will not endure, as a rule, more than one-half of 1 per cent of these salts. It would be of interest to consider the occurrence of alkali soils in each of the Western States, but this is impossible in a single paper. The reader is referred to "Alkali Soils of the United



The dotted section in this area is covered with glacial and loess soils.

States," Bureau of Soils Bull. 35.

Alkali and the Production of Honey

A most important characteristic of western soils is the presence of alkali salts due to a rainfall of less than 20 inches. Of necessity they must exert a great influence on the distribution of vegetation, and upon the growth of crops. Many western farmers have complained that after a few years their alfalfa deteriorated and yielded less nectar. This has resulted, as has been pointed out above, from the rise of alkali in the soils. If there is an appreciable quantity of black alkali in the soil the culture of alfalfa should not be attempted, but this legume has succeeded with 0.4 per cent of white alkali present. The rise of alkali in the soil checks the nutrition of plants, and, as they are in consequence less vigorous, they make less sugar and secrete less nectar.

Sweet clover has been supposed to be more tolerant of alkali than alfalfa, but there is little evidence to support this belief. All the legumes are very sensitive to the presence of black alkali. Sugar beets and sugar cane will grow in soils containing a much larger amount of alkali than most crops can resist. The flowers of the sugar beet yield so little nectar that this species is valueless as a honey plant, but it is of interest to note that in such soils the roots are much smaller and contain a smaller percentage of sugar than in soils free from alkali. The sugar cane also contains a much smaller amount of sugar. These two plants well illustrate why alfalfa and sweet clover tend to produce fewer flowers and less sugar in injurious alkali soils. Forage plants which are grown for their stems and leaves will give better results in the presence of alkali than plants grown for their seeds. Wheat will make a good growth on soils which will not permit the formation of well-filled heads of plump grain. Many fruit trees will make a fair growth, but the fruit is seriously injured in sweetness, flavor and texture. Of all plants valuable for commercial culture, the date palm is most resistant to alkali, but the bloom is nectarless and visited by bees only for pollen.

Cotton on the Black Prairie of Texas secretes nectar abundantly, but on many other soils it is nearly or quite nectarless. As has just been pointed out, a good vegetative growth does not necessarily prove that a plant is well adapted to a soil. Cotton makes a fair growth if a very strong alkali is present, especially if the alkali is common salt; but the injurious effect appears in the smaller number of flowers and bolls and in their late ripening. Nectar secretion is impaired or fails. The black locust and honey locust will also endure a moderate amount of alkali. Other honey plants fairly resistant to alkali are the plane tree, some species of eucalyptus and the golden willow. Asparagus will endure a considerable amount of common salt.

Of native plants growing without cultivation in alkali soils, greasewood

(*Sarcobatus vermiculatus*) and salt bushes (*Atriplex*) are abundant over large areas. But neither of these genera are of value to the beekeeper. Sagebrush, likewise, which covers such vast expanses of the western regions, is nectarless.

Lime Soils

On the north of the little town of Kitzbuehel in the northeast Tyrol there is a limestone chain of mountains, with pale furrowed sides, and on the south a chain of dark slate mountains. The contrast in the plant coverings of the two mountains would strike even a cursory observer, says Kerner, for it is very clearly shown that limestone soils determine in a great measure the vegetation they support. A study of the relation of the plants of this district to soils led Unger to divide them into those which grow on limestone only, those which prefer limestone but will grow on other soils, those which grow on sand only, and those which prefer sand but will grow on other soils.

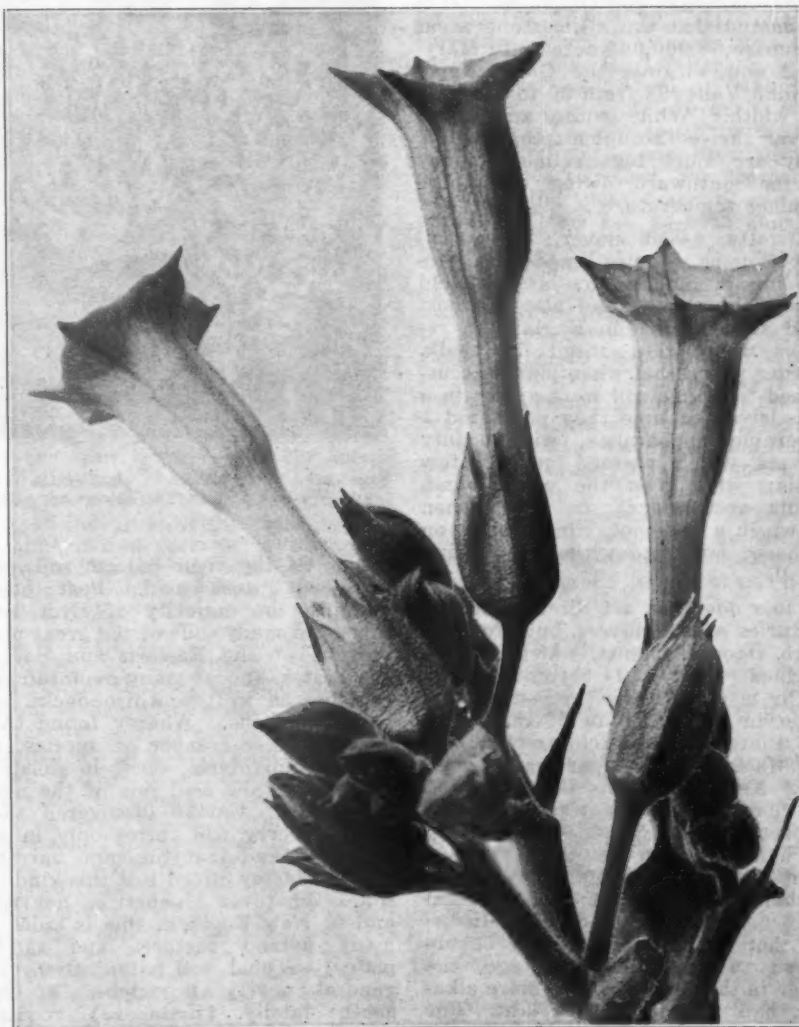
It has long been known that certain plants flourish in soils rich in lime. Schimper and Warming devote much space in their books on the ecology of plants to the consideration of lime-preferring plants, which are called calciphiles (lime-

lovers or calcicolous lime-dwellers); while plants growing on sand are termed silicicolous (sand-dwellers).

The value of lime in growing crops is recognized in many aphorisms, as "lime is the basis of all good husbandry"; "lime makes the father rich and the son poor"; and "a lime country is a rich country." Legumes, as the clovers, grow better on limed soils because they form more tubercles on the roots and the plants are richer in nitrogen than those grown on unlimed soil, as acid is injurious to the nitrogen-fixing bacteria forming the tubercles.

It is well established that the clovers are most abundant, grow most vigorously and, other conditions being favorable, yield the most nectar on limestone soils. In general, they are excellent honey plants on the glacial soils of the northern United States. These soils cover most of New England, New York, Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, eastern Dakota, Nebraska, northeastern Kansas and northern Montana.

Other extensive areas underlaid by limestone are the Great Appalachian Valley, which extends from eastern Pennsylvania to central Alabama, lying between the Blue Ridge on the



Tobacco blossoms, natural size.



Fetter-bush. A shrub growing on acid soils.

east and the Allegheny Mountains on the west; the Nashville Basin of Tennessee; the Blue Grass region of Kentucky, and the Ozark Uplands of Missouri, Arkansas and Oklahoma. It is estimated that these limestone areas comprise 68,000,000 acres. In Maryland and Virginia the Great Appalachian Valley is from 20 to 30 miles in width. While white and alsike clover thrive throughout this region, they are much less reliable honey plants southward, owing to a high summer temperature.

Alfalfa, sweet clover, indeed all the legumes, require limed soils. According to Sladen, the largest yield of sainfoin honey and also the best seed are obtained in England in regions where the subsoil is chalk. Kerner found that when plants accustomed to a lime soil were grown in a soil devoid of lime they presented a miserable appearance, with scanty flowers which ripened only a few seeds; while, on the other hand, plants accustomed to sand, when grown in a soil containing lime, soon withered and died without flowering at all.

Lime does not act directly on the nectaries of the clovers, but produces more vigorous plants, which in turn produce more and better flowers. Sugar is one of the first substances made in the nutrition of the plant, and a large, vigorous clover plant will manufacture more sugar than a small one. Kenoyer reports that he found the quantity of sugar in the nectar of vigorous white clover plants very much larger than in the nectar of stunted plants. Plants differ widely in their feeding power and some require more lime than others. In order that lime (calcium) may be obtained to the best advantage, the water in the soil should be more alkaline than the sap of the plant. For the best growth of the clovers most soils require an application of lime.

Even in Lancaster and York Counties, Pennsylvania, a limestone region, 460 pounds of lime per acre are needed.

The Acid Soils of the Eastern States

It was long believed that soil acidity had no influence on the distribution of native plants. "During the last five years," says Wherry, "however, newly developed methods of interpreting and determining acidity have been applied in several widely separated regions—Sweden, Denmark, the northeastern United States (and subsequently in India and England), with the same result in all cases, recognition of the great significance of the acidity of the soil in controlling the growth and distribution of native plants."

There is a vast difference of acid soils in the Eastern States, for example, as the result of the study of 1,474 samples of soil taken from 150 counties in Pennsylvania, 72 per cent of the soil areas were found to be

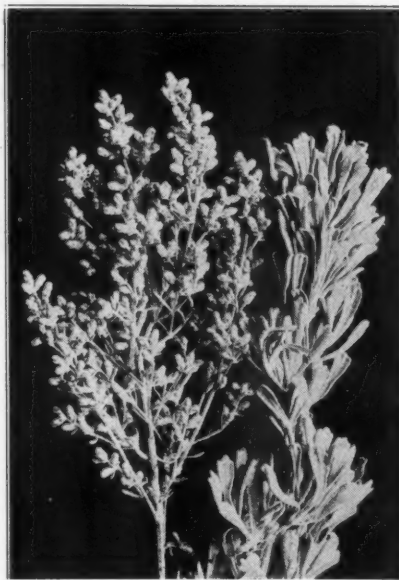
known honey plants, as the sweet pepperbush, Labrador tea, Andromeda, fetterbush, sourwood, bearberry and heathers, as well as the blueberries, cranberries and huckleberries. Tests made by Wherry showed that 42 species of the heath family in their native habitats grew in acid soils.

The gallberry, so valuable in the South as a honey plant, avoids limestone soils. It flourishes in sandy, acid soils near the coast of both the Atlantic and Gulf of Mexico Coastal Plains. On the poorly drained flats, known as upland swamps, there are associated with it dense growths of highbush huckleberry, titi, tupelo, myrtle, bay and cypress. The cypress is, of course, nectarless. But in Florida lime hammocks, swamps and streams occur, in fact, the Everglades are underlaid by limestone. Many honey plants are restricted to acid soils, and attempts to grow them on lime soils would be useless.

Salt Soils and Honey Plants

There are a few honey plants which are confined to soils rich in common salt (chloride of sodium), as the black mangrove, the salt marsh goldenrod, and the sea grape. The sea grape grows on the beaches of southern Florida, and on many of the islands, where it is exposed to the full force of the salt spray driven by storms. It is less valuable than the black mangrove, but it occasionally yields a surplus of good honey. On the other hand certain families avoid saline conditions, as the rose family. Apple trees and other fruit plants do not grow well near the sea. The heaths, likewise, which are acid soil plants, are absent from such localities. The presence of salt in the soil interferes with the nutrition of these plants and they form food with difficulty.

Waldoboro, Maine.



Sagebrush. A very common plant in the semi-arid Western States. The flowers are nectarless.

acid. Of the river bottom soils, 82 per cent were acid. Peat bogs, swamps, the majority of river bottoms, the sandy soils of the great pine barrens of the Eastern and Southern States, and of many mountainous regions, as in the Adirondacks, all have acid soils. Wherry found that "the greatest number of species, as well as individuals, occur in soils lying just on the acid side of the neutral point." Coville discovered that the blueberry will thrive only in an acid soil, and that the pine barrens of New Jersey afford just this kind of soil. Wherever blueberries flourish, and in New England, this is true of many upland pastures and sandy plains, an acid soil is indicated. In general, nearly all members of the heath family (*Ericaceae*) require an acid soil. It will be remembered that this family includes many well-



Asparagus. Escaped from cultivation and growing along salt marshes from New Brunswick to Virginia.

FLIGHT STUDIES OF THE HONEYBEE ✓

By Wallace Park, Iowa Experiment Station

BEES have been considered speedy fliers, as is indicated by various estimates, some of which run as high as 120 miles per hour. Conservative writers have put their estimates at 30 miles and less. Those of Cheshire, Cowan, Buttel-Reepen and Sabine are based on more or less careful observations, but apparently none of the previous observers took particular account of that very important factor, the wind.

Experiments were carried on at the Iowa Experiment Station in 1920 and 1921, not only to secure more definite information about the speed of the bee, but also to study the reactions of the bee to the influence of the wind.

On a day after the close of the honey flow, a marked bee was taken across an open field to a point about a fifth of a mile from its hive, where it was allowed to fill up on syrup. The bee made repeated trips to this spot. One observer stood by the hive with a stop watch in hand while another was stationed near the dish of syrup. As the marked bee left the hive, the watch was set going and a signal given to notify the second observer that the bee was on its way. The instant the bee alighted, a signal was given to stop the watch. The return trip was timed in a similar manner. Records were obtained of about twenty-five consecutive round trips on each of four different days.

The velocity of the wind was determined at the beginning and at the end of the period by means of a portable anemometer, placed at about the height of the bee's flight. The average of the two readings was used in the calculations. The exact distance was determined by running a line with a surveyor's chain.

The experiments were carried out in such a way that one set of data (A) was secured when the wind was directly against the bee as it left for the field and with its flight on the return. When the second set (B) was obtained, the wind was at right angles to the line of flight. In the case of the third (B2) and fourth (C) sets, the bee left the hive with the wind and returned against it. The designations B and B2 were employed to indicate that the same bee was used in securing these two sets of data.

In accordance with one of Nature's laws, a bee traveling with the wind is assisted in its flight to the extent of the velocity of the wind, or if traveling against the wind the bee's progress is hindered to the extent of the wind's velocity. If the bee flies at an angle to the wind, its rate of progress will be the resultant of the velocity of the bee and the velocity of the wind, and may be determined by triangulation. Then the fair way to compute the normal speed of the bee

is to reduce all results to terms of calm. This was done, and the results appear in the fourth and eighth columns of Table 1. And, except where stated otherwise, these are the figures under discussion throughout the remainder of this paper.

Table 1.—Influence of Wind on Speed of Honeybee (1).

Empty (Out)				
	Bee	Observed Speed	Correction for wind	Speed in a calm
With wind.....	B2	19.7	-7.7	12.0
	C	11.3	-4.5	6.8
Against wind..	A	12.4	+5.6	18.0
Right angles to wind 2.....	B1	8.8	+4.7	13.3
Average.....				12.5

Loaded (In)				
	Bee	Observed Speed	Correction for wind	Speed in a calm
With wind ...	A	18.6	-5.6	13.0
	B2	8.3	.7	16.0
	C	11.5	.5	16.0
Against wind..				
At right angles to wind 2.....	B1	10.7	+3.9	14.6
Average.....				14.9

It will be noticed that the speed found for loaded bees varied only a little, the lowest being 13 and the highest 16 miles per hour, while the average was approximately 15 miles. But the speed of empty bees varied from 6.8 to 18 miles per hour, and averaged 12.5 miles, or 2.4 miles per hour less than the average for homeward bound bees.

The fact that the speed shown for outward-bound bees varied much more than that for homeward-bound bees, suggests the probability that a bee on its outward journey often does not make a so-called "bee-line" (3) for the source of supply, but may do more or less scouting on the way. If this is the case, the distance actually traveled was greater than the measured distance. Then the speed for outgoing bees would be somewhat greater than indicated by the data. But the amount of time recorded was actually consumed during the outward trip, so calculations must be based on the recorded time.

It is significant that when flying at right angles to the wind, the outgoing bee flew at the rate of 13.3, and the incoming bee 14.6 miles per hour, since each approaches rather closely the general average for its respective class. Furthermore, this case emphasizes the fact that, in spite of the heavier load, the homeward journey was usually accomplished in less time than the outward journey. As may be seen from the table, the only case in which the outgoing bee made better time than the incoming bee, was

1. Speed is given in miles per hour.
2. Wind velocity was 10 miles per hour.

when flying directly against the wind.

Another noteworthy fact is that the least speed was shown when flying with the wind, on both outward and homeward trips; whereas, the greatest speed in each case was attained when flying directly against the wind. It appeared that when going with the wind, the bee showed a tendency to slacken its own efforts; whereas, in traveling against the wind it increased them in an attempt to overcome the retarding influence of the wind.

Temperatures were relatively high during these experiments, being between 70 and 80 degrees Fahrenheit at all times. No relationship between temperature and rate of flight was apparent within this range. A wider range in temperature, however, might yield a correlation.

A maximum speed of twenty-five miles per hour was recorded for both outgoing and incoming bees, but it was found that bees would not long continue to work in a wind blowing fifteen or more miles per hour. This is another indication that the bee's normal rate of flight in a calm is little, if any, more than fifteen miles per hour.

A Lucky Find

A pure streak of good luck is responsible for a very satisfactory check on the experiments just related. On August 20, 1921, one of our marked water carriers was discovered by Mr. R. L. Parker while getting its load from a watering place for bees in Mr. Parker's yard. He at once got in touch with the writer by telephone and, after setting our watches together, we proceeded to record the time of arrival and departure of this bee at both ends of the line.

The bee flew at right angles to a light breeze having an estimated velocity of three miles per hour. Later, the distance traveled by the bee was found to be just two-thirds of a mile in a direct line. The records, when brought together, showed that the average rate of flight, whether loaded or empty, was 14 miles per hour, which, in terms of calm, would be 14.3 miles.

Summary

1. Time records for homeward-bound bees showed considerably less variation than did those for outward-bound bees.
2. On the average, less time was consumed on the homeward trip than on the outward trip but, when flying directly against the wind, the empty bee flew slightly faster than did the loaded bee.
3. The effort put forth by empty and by loaded bees was least when flying with the wind and greatest when flying against it.
4. A maximum speed of 25 miles per hour was found for both outgoing and incoming bees.
5. Bees made but little progress against a wind having a velocity of 15 miles per hour.
6. The average speed found for the flight of bees in a calm was a little less than 15 miles per hour.

REVIEW OF OHIO BULLETIN NO. 357— DISSEMINATION OF FIRE BLIGHT

By J. H. Merrill, Apiarist, Kansas
State Agricultural College

THIS Bulletin is of particular interest to beekeepers, due to the amount of consideration which is devoted to bees as possible disseminators of fire blight in orchards. However, a careful study of the entire bulletin should convince the reader that bees have been in the past unjustly accused as the sole distributors of fire blight.

It is to be regretted that the authors were obliged to stop their work in 1917. Had they continued with their investigations, it is probable that they would have arrived at somewhat different conclusions. This statement is based on the fact that many of their results are inconclusive and furthermore upon the fact that in a latter portion of the bulletin which was written after 1917, the blame is placed elsewhere than on the bees.

In the introduction to this bulletin the authors quote from D. H. Jones in Bulletin 176, Ontario Agriculture College, pages 23-34. In this quotation Professor Jones says: "Waite, of the United States Department of Agriculture, has found the organisms in the nectaries of apple blossoms and also on the legs and mouth parts of the bees." He also says: "The question is, where do the bees in the first place get the contamination?"

Unfortunately, the authors of the Ohio Bulletin have not in any way answered this question. Rather, they pay particular attention to the fact that bees which have visited infected flowers carry away the germs of this disease. This is indeed regrettable, as the casual reader is very apt to receive the impression that the bees are primarily responsible for the presence of fire blight in an orchard.

It is human nature to attempt to explain things that are not generally understood. Occasionally these explanations are based on facts, yet

quite often they are founded only on fancy, or, rather, an apparent explanation may be accepted as satisfactory. It has long been known that fire blight spreads rapidly through an orchard, and since the discovery of the germ theory it seemed only necessary to find a possible carrier for these germs in order to detect and convict the criminal. Of all the insects to be found in an orchard at blossoming time, honeybees are the most numerous, consequently, without inquiring too deeply into the matter, many observers concluded that the honeybees caused fire blight. This statement was generally accepted, found its way into the textbooks, and was taught as gospel truth throughout the country.

The authors of this bulletin found that the bees carried fire blight germs on different parts of their bodies. They found them there; therefore that is a scientific fact and should be accepted as such, yet it does not warrant accusing the honeybees of being the sole culprits engaged in spreading fire blight.

If a boy lost his ball in a mud puddle and in trying to get it slipped and fell, mud would undoubtedly be found on various parts of his clothing, and if the boy should then walk upon a perfectly clean floor he would probably leave muddy footprints behind him. In such a case the boy could properly be called a "disseminator" of mud, but this would not necessarily prove that the boy put the mud into the puddle. What should be done is to find who primarily put the mud into the puddle, or the fire blight into the blossoms.

They found that the fire blight organism would last for ten days in aphid honeydew, and the inference was that the bees might become contaminated from the honeydew and spread the disease to the apples. It is very questionable whether bees

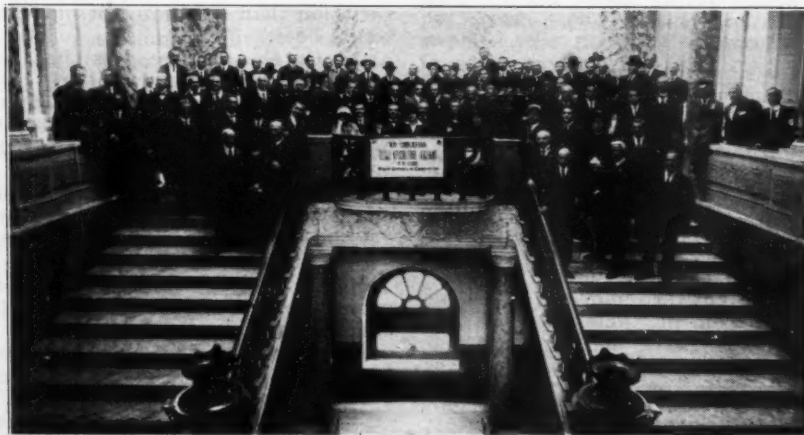
would bother honeydew while there was a good apple bloom accessible. It was further found that the bacteria would live in peach, plum and cherry blossoms. Peaches, plums and cherries all finish blooming before the apple blossoms appear. If any contaminated honey was taken into the hives from these sources it would probably be either consumed or capped over before apple blooming time. It is doubtful if this could possibly serve as a source of fire blight infection. The natural query is again, who put the germs there?

It has been shown by experiments conducted at the Kansas State Agricultural Experiment Station that the aphids which swarm over the trees before blooming time, not only can, but do, carry the blight organisms. They crawl over the twigs, and if there are any exuding cankers in their path they have an excellent opportunity of becoming infected. As the buds open, these aphids crawl down and insert their probosces into the as yet unopened flowers. If they are covered with blight bacteria they probably will inoculate the blossoms before they are even visited by any bees. In large commercial orchards it has been noticed that blight was always heavier during those years when aphids are unusually abundant. When the aphids were destroyed on part of a block of Jonathans, these trees remained practically free from blight throughout the season, while the remainder of the block was badly infected with blight. It is not reasonable to suppose that the bees only visited those trees which were not sprayed. Furthermore, the bee, in its quest for nectar and pollen, goes directly from blossom to blossom, and could not possibly come in contact with any exuding fire blight cankers.

The statement is made that the blossoms which have been pollinated 72 hours are not likely to be inoculated with fire blight. If this should prove to be a fact, it would be not only an interesting but a valuable one; but before accepting it as such it would seem advisable to continue the experiments along this line.

The last part of the bulletin takes the curse from the bees because it deals with observations on the part played by rain in disseminating fire blight. The authors have concluded that from 50 to 90 per cent of the blight is spread by rain. In view of the fact that a great many orchardists favor keeping the bees out of the orchard to prevent an infection of blight appearing there, it would be interesting to know if they would also favor keeping out the rain when they learn that it is so largely responsible for the spread of fire blight.

Toward the close of the bulletin the authors make a statement which the reader should observe carefully. It is as follows: "Because of the relationship indicated by these researches between exuding cankers, blighted blossoms, rain, insect honeydew, and sucking insects, the recommenda-



Italian National Congress of Beekeepers held at Chambers of Commerce, Naples, Oct. 19-20, 1922.

tions which have quite generally been made by other writers for the destruction, early in the season, of local cankers and sucking bugs, must be emphasized even more than formerly." (The emphasized words are mine, not the author's).

As a general criticism of this bulletin, it may be said that there is no explanation offered as to how the fire blight organism originally gains access to the apple blossom. It must be admitted that the authors found blight bacteria on the bodies of bees which had visited flowers already contaminated by some unexplained medium. Too much stress and too much space is devoted to discussing the possibilities of the honeybee as a disseminator of fire blight. This is especially true when the fact is taken into consideration that later in the bulletin it is stated that from 50 to 90 per cent of the fire blight in an orchard

is spread by rain. Bees do not visit cankers, but the rain can and probably does wash the spores from these cankers into the open blossoms. No explanation is offered as to how fire blight could be spread in young trees in nurseries which probably would never be visited by bees, or, if they were, could not be punctured by them in such a way as to make a possible entrance for the bacteria. One of the shortest paragraphs in the bulletin is that in which it is advised to remove all blight cankers. It really seems as though this advice is more valuable than all the data secured in regard to finding blight bacteria on bees, in honeydew, or in honey. Furthermore, the authors make a positive statement that in those orchards where bees are kept, larger crops of apples are secured than in those orchards where bees are not maintained.

A NEW AND EFFICIENT TREATMENT FOR AMERICAN FOULBROOD ✓

By H. F. Wilson, University of Wisconsin

SOMETIME in the future we may be able to completely eradicate foulbrood diseases of bees. However, this mirage is so far distant that in the meantime any method of treatment which will help to check the spread of these diseases should be welcome. It is quite likely that we will be able to develop a treatment whereby European foulbrood can be eliminated from the hive without destroying the brood combs.

In the case of American foulbrood it does not seem possible to eliminate the disease from an infected colony because of the practical impossibility of destroying the spores in the dead scales or sealed honey. If, however, we can develop a method for sterilizing used beekeeping equipment and extracting combs economically and efficiently, we will have accomplished a great deal.

Recently, Dr. J. C. Hutzleman (Gleanings in Bee Culture for December) described a method of sterilization for combs infected with American foulbrood spores which gives considerable promise of success.

We present here another method which has proven effective in practice and one or both of these methods should be of great value to the beekeeper in the prevention and eradication of American foulbrood.

The experiments which led to the discovery of this new method were brought through an attempt to determine whether or not the chemical known as Bacilli-Kill, used by Mr. Lewis in British Columbia for the control of European foulbrood, would be effective as a treatment for American foulbrood. The materials were furnished by the General Laboratories of Madison, Wisconsin, and Mr. F. B. Hadfield, chemist and bacteriologist for this company, was a co-worker in all the experiments. Our preliminary

experiments with B-K were along the line of feeding experiments, to eradicate the disease from the colony without shaking the bees and destroying the combs. These experiments were not successful, as we could not effectively destroy all sources of contamination while brood was being reared.

While conducting these tests we did find, however, that infected honey and syrup was completely sterilized by B-K. We also used a special form of sodium hypochlorite, differing from B-K in its chemical composition and which proved more satisfactory than B-K. Observations on these experiments led us to other experiments and so, later, four series of experiments were carried out as follows:

1. To determine whether diluted solutions in sugar syrup fed to the bees would have any effect on control of the disease in a working colony.
2. To determine whether combs containing dead larvae or dry extracting combs from diseased colonies might be treated and used again without carrying the infection.
3. To determine whether infected honey might be treated so that it could be fed back to the bees without danger of carrying the infection.
4. To determine whether sodium hypochlorite might be used as a disinfectant for hives, hive parts, extractors and other equipment.

The results of these experiments show that sodium hypochlorite has a solvent action on dead bees, pollen, cocoons and other debris in the combs, but that it does not injure the wax, and while certain concentrated solutions will dissolve a dead bee in a short time, diluted, they are not at all harmful to the bees when added to their food.

Larvae dead from foulbrood and living in the cells as scales were com-

pletely dissolved out in 24 hours. Four of these combs placed in colonies of bees in June remained free of disease throughout the summer, although the bees continued to rear brood in them.

Sugar to which a water solution of spores had been added failed to carry the disease when treated with a weak solution of sodium hypochlorite.

In an experiment where three colonies of bees were fed a diluted solution of diseased honey treated with sodium hypochlorite, two of the colonies had not showed any signs of disease six weeks after feeding; the third colony developed the disease, but there is evidence to show that the disease may have come from an outside source.

For disinfecting hive bodies and equipment a special solution was found to be 100 per cent efficient.

Experiments in feeding to counteract the disease in colonies already infected were unsuccessful.

The particular value of a special hypochlorite finally decided upon is that it destroys the spores wherever it comes in contact with them, but is not poisonous, and may be fed in syrup or honey to the bees without apparent injury to them.

HONEY AND WATER—A NON-FREEZING SOLUTION

By Wm. A. Braun

This extremely original and practical use for honey plays a novel part in preventing water from freezing when mixed with it. When in solution with water, honey is both reliable and efficient.

The mixture is very simple. It is but a solution of equal parts of honey and water by volume. All one needs to know when preparing the first amount is how much water his radiator holds. There is no evaporation of the honey, so all that is necessary, after the first filling is to add such amounts of water as may be required. One could use less honey in some cases, but there is no need of making the mixture vary from the proportion given. The original cost is not great; the additional protection given is well worth having. The mixture of equal parts of honey and water is almost immune from freezing. It is a sure and positive preventive against freezing, users claim.

As for economy, it need but be said to be about 40 per cent of what a mixture of alcohol and water would be to render a like service. The average car used during the winter months requires approximately six gallons of alcohol. There is always a dread of freezing, even then, for evaporation is high with the alcohol and water solutions. One never knows just how much alcohol is left; there is no guessing with honey, as it does not go up in fumes. To serve and keep serving is what honey proves its purpose to be.

There is no reaction of any kind whatever on the metallic parts when this solution is used. Cooling is in no

way impaired, as the mixture flows as readily as water, that is when it is warm. Sticking to the radiator cores and clogging of the water circulation system occur with some solutions, but not with this one. Another salient feature is the fact that there is but a little raising of the boiling point. This means that one will not be likely to have the solution to boil. With some solutions over-heating is frequent. Another feature worth mentioning is that there are no disagreeable fumes given off. To the user of a closed car this should appeal espe-

cially, for they well know what the fumes of denatured alcohol are like.

A new market is formed if the use of honey for this purpose is agitated. Green honey, in fact the greener the better, is what is usable. This does not mean that other grades will not render proper service. They will. What the beekeeper has here is a new and better article. By means of a little publicity for this product as a non-freeze solution base, much of the cheaper honey would find a sale.

Wisconsin.

BEES IN A GREENHOUSE

By C. P. Dadant

SINCE I mentioned in the Journal having seen bees kept successfully in a hothouse, I have received enquiries regarding this matter. So I will now tell the tale of it. Perhaps the name "hothouse" is hardly proper, for it was not hot all the time.

Some 6 or 8 miles from our home, an old French gardener lived. This was some 60 years ago, and he has been dead a long time. He had been a gardener in Paris in his youth and had learned how to grow from 2 to 6 successive crops of vegetables on the same piece of land in the same summer.

He bought 3 acres of land. This land had about an acre fit only for pasture, as it was crossed by a creek of running water. On the other edge of the land, running from north to south, a ditch about 8 feet deep and 18 feet wide, carried the surface rain water from a neighbor's level field, on down towards the creek, along the west line of the three acres. Most of us would have considered this part of the land as worthless. Not he. He squared it, walled it up at its upper end, which was abrupt, walled it also on the sides and across, just far enough to build his house upon it, making a side drain to prevent any further coming of water from the neighbor's land, through it. He thus had a very inexpensive cellar. Beyond the cellar, and south of it, he made the ditch into a hothouse, by also walling it and roofing it with glass. Thus the little hothouse, 18 feet wide by about 10 feet in depth, was entirely protected by earth on both sides, east and west, by the cellar and house on the north, and faced the south sunshine. It was a very warm place in winter. The balance of the ditch, banked with bluegrass, had a row of grapevines planted on each side.

A few years later, having seen our success with Quinby hives, he built 6 hives of that kind in the south wall of his greenhouse, with entrance on the south. The colonies were separated from one another by only an inch board, and this created a difficulty when I took charge of them, for it was impossible to put a super on one of them without interfering with the neighboring hives, unless the super

was made of half-inch lumber only. Even then, there was no room to spare. Likewise, as they were built into the inch front wall of the hothouse, there was not room enough to place the supers squarely on the hives. This and the too close proximity of the colonies compelled us to remove them. But those colonies were the best and most productive of any that I ever handled.

The hothouse (so-called) had no fire in it during the early winter months, as it was used only to raise early plants for the garden. So the bees had no undue amount of heat in winter, except such as one might expect from a building so sunk in the ground, fully protected on the north, with a glass roof, and the only unprotected side, the front, facing south. It secured all the rays of the sun.

A little stove, early in March, supplied what heat was needed to protect the plants, and of course kept the hives warm for early breeding.

Never did I see such populous colonies early in spring. As I had undertaken to establish an apiary there, I brought some 24 colonies of our own. But there was no possible comparison between the new-comers and the old hothouse colonies. The latter were perhaps as four to one for productiveness. If it were not for the expense of such a building, I should very much like to try it again.

While I am on this subject, may I depart from beekeeping to say a few words about careful gardening? I remember reading two books on gardening, about that time: "Ten Acres Enough," and "Five Acres Too Much." This gardener, with less than two acres of tillable soil, made an average of \$2,000 a year, from garden truck, chickens and bees. Mind that this was in the seventies, when money had more value than now. But he used the most painstaking methods of the old country gardeners, who have to make their living on land worth several thousand dollars per acre, in the vicinity of large cities. Every inch of land was in use; every part of it was heavily manured every year; no weeds were allowed to grow; straw mats were employed wherever there was danger of frost to the young plants. It was

from him that I learned the use of straw mats on the brood chamber of hives, and I sometimes wonder whether it would not pay us even to build our hives with a thickness of straw on the outside, to protect them from the heat of the summer sun and from the cold of winter nights. It would secure the advantages of the old straw skep, with the benefits of the movable-frame hive. Better than straw would be either sort of slough grass, tough, durable and strong, Beckmannia or Spartina. These grasses are found quite plentifully along the low lands of the rivers in the Middle West. Straw mats are used in many European countries to protect the trees in winter, but plants, shrubs and even trees are trained in espaliers against walls. Such walls would be good in our Central States to protect the trees in winter, but would roast them in summer. But with such a protection, the orchardist of Europe may sell his fruit in advance, for he knows exactly how many peaches he can raise if he takes care of them. There is no possible loss.

I often wonder whether we could not succeed as well with a few colonies, protected in the above mentioned manner, as with a large number of colonies kept in the western way.

VISION OF THE BEE

Editor of the American Bee Journal:

In the December number of the American Bee Journal von Buttel-Reepen gives a brief review of the well-known experiments of K. v. Frisch on the color vision of the honeybee. According to v. Frisch it sees blue, yellow, white and black. Its color sense is dichromatic, or it sees only two spectrum colors, blue and yellow. A series of experiments by Kuhn are likewise described, which are believed to show that honeybees can see ultra-violet light which is not visible to the human eye. The center of the normal human retina sees all the spectrum colors, red, orange yellow, green, blue, indigo and violet; its periphery, or outer surface, is color-blind and sees no colors; the intermediate zone between the periphery and the center sees only blue and yellow, or has the color vision of bees (if v. Frisch is right). The bee has, therefore, a much less highly developed color sense than the human eye. While it may be possible, it certainly seems improbable that the bee should see ultra-violet, which is invisible to the human eye. May it not be that in the experiments of Kuhn the bee was guided in some other way than by ultra-violet vision?

Let us approach the problem from another point of view. Of what use would it be for the honeybee to possess ultra-violet vision? If it is of no use, such a color vision would not be likely to present. Animals which live in dark caves are apt to lose the sense of color vision altogether. But it has been suggested that if flowers reflect ultra-violet rays, then insects

might respond to these rays in their visits to flowers, and be guided by them as they are by certain spectrum colors. Do flowers give off ultra-violet rays? As the result of the investigations of Professor F. K. Richtmyer, of Cornell University, we are able to answer this question; a description of his work will appear in the February number of the Journal of the Optical Society of America and Review of Scientific Instruments, to which latter I may refer at greater length. In a private letter to the writer Professor Richtmyer says that flowers in general reflect very little ultra-violet. "Certain types of yellow flowers seem to be exceptions, the most notable of these being the ordinary, wild, golden glow." Now, as violet consists of blue and red, the color sensation received from ultra-violet would probably be purple. It is admitted that the honeybee sees yellow; what advantage, then, could it be to this insect in its visits to yellow flowers also to see the ultra-

violet reflected by them? Moreover, if ultra-violet is beneficial as an allurements in flower pollination, why should yellow flowers alone reflect these rays? Would it not also be likely to be reflected by red and green flowers, which, according to Frisch, have hues the honeybee cannot see.

We admit frankly that we are skeptical of all claims for very unusual or bizarre qualities in the vision of the honeybee. We do not forget that a little while ago Bethe asserted that the honeybee had no senses at all, but was led back to the hive by an unknown force which draws it as a magnet draws iron from filings; or that more recently Hess has insisted that he has proved that the honeybee is totally color-blind; or that some years ago Mueller and Lubbock believed that they had shown that the honeybee has an aesthetic color sense. It may be that the honeybee responds to ultra violet light in some way, but we doubt if ultra-violet light is visible to it. John H. Lovell.

CAUCASIAN GREY MOUNTAIN BEE ✓

By C. A. Gorbacheff

(Translated by Peter Schaffhauser)

A CLOSE acquaintance with the Caucasian bee shows convincingly that there exists in the Caucasus a distinct race of bees, to be found pure in the high mountain regions of Transcaucasia; that is the grey Caucasian bee.

Investigations of the length of the tongues of the Caucasian bees, as compared with that of the bees from the middle of Russia, as well as the experiments made in a comprehensive manner by Mr. Klinger and by other practical beekeepers, prove convincingly that the gray bee from the mountainous district of the Caucasus, owing to her long tongue, is able to get the nectar from flowers like the red clover, for instance, that are inaccessible to other varieties of bees. Those investigations attracted the attention, not only of the beekeepers, but of the farmers as well.

The opinion that there are in the Caucasus many breeds of bees, like those of Abhazy, Kabahtapa, Kahety, Dagestan, Erivan, Kutais and others is ungrounded.

In Lenkoran, a district near the border of Persia, there are bees of a golden hue. These bees differ in appearance, and by their biological peculiarities they vary much from the pure Caucasian grey mountain bee and belong to a different breed called the Persian bee. This last variety was first described by Pallas as a distinct species, the *Apis remipes* Pallas, and since Mr. Bastleroff this bee was wrongly supposed to be the typical bee of the Caucasus.

In the valleys of Transcaucasia and in the Northern Caucasus there are to be found crosses between the grey mountain bee and the yellow bee of Persia; it may be easily noted that the cross breeds from Transcaucasia

show in a striking manner the peculiarities and qualities of the grey mountain bee, and the cross breeds from the Northern Caucasus resemble more closely the Persian bee. The bees of the Persian breed, as well as the cross breeds in the valleys of Transcaucasia, and especially those from the Northern Caucasus belong to the Southern bees.

It appears from quite a number of reports made by beekeepers residing in the North and having imported for their apiaries the cross bred bees from northern Caucasus and the Persian bees, the so-called Lenkoran variety, that these bees, when under the trying climatic conditions of northern and middle Russia, feel quite miserable and don't justify the well-founded reputation that the grey mountain bee has acquired, a reputation that every year is establishing itself more firmly. Neither the Persian bees nor their crosses can be recommended for breeding in the northern beekeeping districts.

As to the coloring of the mountain bees, the bees from Erivan and those from some parts of the district of Kars are an exception to the rule, because they are nearly as brightly colored as the Persian bees. There is no doubt that they are close relatives to the Persian bees. They have lived for a long time under the trying conditions of the mountain regions of the districts of Kars and Erivan and become acclimatized and acquired the qualities peculiar to the Caucasian mountain bee.

Caucasians in Siberia

"In 1911, July the 9th, I received from Ghelenjik, Black Sea District, a two-frame nucleus with a queen. In the fall I put them, 90 per cent normal, in the cellar. On March 26, at 8 degrees R. in the shade, I put them

out. To my satisfaction they came out very well. On April 20 I found foulbrood in them. After treatment, on May 26, I put them on four frames with full sheets of comb foundation. On the 10th of June the colony was occupying 10 frames, on the 13th I put on a super. August 15 it was strong and gave a surplus of one pood (36 pounds) weight. Now judge the quality of the Caucasians. I am perfectly satisfied with them."

P. Medviedeff.

Caucasian Bees and Red Clover

Mr. T. W. Klinger has taken special care to test out the length of the tongues of the Caucasian bees, not so much to receive a considerable amount of honey, but rather for the fertilization of red clover, which is possible only with the assistance of insects and bumblebees.

With this point in view, in 1908, they ordered from Gagri, Sukum Province, 40 Abhasian colonies. They were distributed on the estate of Great Prince Michailo Alexandrovich, in Orel Province, middle Russia, of 3,490 acres. A field of 60 acres in red clover gave about 240 pounds of seed per acre. On another farm eight versts off (a little over 5 miles) without Caucasian bees they gathered only 17 pounds per acre.

In 1912 there were on the estate already 1,600 colonies of bees for the purpose of fertilizing red clover in the area of 3,490 acres, which made up only half of the number of bees needed.

Tiflis.

WAX SECRETION ✓

By Dr. Brunnich

Dear Mr. Dadant: You ask my opinion as to whether pollen is used in the production of wax by the bees. As this question is of general interest, I wish to go into details.

This problem was studied in a most thorough and ingenious manner by our old master, Berlepsch, whose book, "Die Biene und ihre Zucht mit Beweglichen Waben," cannot be too much recommended to every scientific apiarist who understands the German language. What this celebrated investigator writes on the production of wax will undoubtedly interest your readers. He says:

"When we dissect comb-building bees, we find in their bodies much honey and pollen, the same as with brood-rearing bees. Gundelach made an experiment in order to find how much honey bees must consume to secure a quantity of wax; it required 20 ounces of honey for one ounce of wax, when bees had no pollen at their disposal."

Berlepsch repeated a similar experiment five times over. He forced confined bees to build combs in a dark room, feeding them three times with thin honey and twice with sugar syrup only. In the first case, he found an average proportion of 20 1/2 to 1; in the second case, with sugar only, 19 to 1. Then he repeated the experiment, but gave the bees pollen

also, and found the proportion only 13 to 1.

As bees cannot feed brood with honey only, similarly they cannot build combs for a long time, when fed only honey. The extraordinary production of wax seems to affect them exceedingly and to emaciate and exhaust their bodies, as the following experiment proves:

"In the end of August, 1852, I united some colonies, hived them into empty Dzierzon hives and fed them as much as they would take. In the beginning they did well; during the first 16 to 18 days they built combs and had much brood, although I soon found many dead bees with swollen abdomens. The mortality increased from day to day, and from the 23rd of September building and breeding ceased, and after 6 more days they took no more honey, although I had brought them into a heated room. The colonies dwindled away, most of the bees were faint and worn; the brood was nine-tenths dead. I wished to test whether they would no longer breed and build; therefore I took away all the combs of a colony which had not taken food for 4 days and placed them in an empty hive. The bees took no honey at all and died in increasing numbers. I must add that from the end of August there are rarely any blossoms to be found in Seebach (the village where Berlepsch dwelled), therefore the colonies found only very small quantities of pollen."

Jahne holds that wax is made only from honey; because it contains no nitrogen, therefore no pollen is needed. This assertion is refuted by Dzierzon, as follows: "Because wax, as I admit, contains no nitrogen, it does not follow that the bees need no pollen, or, in other words, no nitrogenous matter, for a continued production of wax. The wax-producing engine is an animal body and requires restitution of the substances which are worn off by the labor, as steam engines need constant fuel if they are not to stop. To conclude that nitrogen is not necessary in the production of wax because wax does not contain any nitrogen is a fallacious idea. It appears to me the same as if a chemist analyzed the make-up of a steam engine and concluded that it needed neither carbon, oil or water, because the engine contained none of those substances."

"The bees can, indeed, produce wax from honey alone, as Huber, Gundelach and Berlepsch have shown. But they can do so for only a short time, because their bodies are giving up nitrogen constantly. Every animal has a supply of the substances which it needs for the preservation of life, and it is able to prey upon its own fat for some time. Similarly, bees have a certain supply of nitrogenous matter in their bodies, and although able to produce wax from honey only, if the provisions are absorbed they are no longer able to do so."

I trust these quotations are self-explaining. For a long time, our physiologists were too prompt to re-

duce all vital processes to chemical formulae. Today we know that an animal may be fed sufficiently—regarding the calories and composition—and nevertheless may perish if it does not find in its food the necessary "vitamines," substances whose nature is still quite occult, but whose presence has been proved in many in-

stances. In the same manner, every vital process requires some albumin, although chemically this seems superfluous. For work, our muscles seemingly need only hydrates of carbon (sugar), but, notwithstanding, the muscles would soon begin to "strike" if their food was short of nitrogenous matter.

RANDOM REMARKS ON QUEEN BREEDING

By John Protheroe

EVERYONE has his own idea of how to start grafted cells. The formula I would give is, nine frames of capped brood, seven frames of eggs and larvæ, one frame of pollen, two cell-bar frames, a Doolittle feeder, and an excluder. There should, of course, be a population of bees like a kettle of boiling milk. Queen, capped brood, and pollen on the ground floor below the excluder. This is not ideal for the pollen, seeing that one's aim is to keep the nurse bees upstairs, but it is necessary if everything is to be fitted in. Eggs, larvæ, cell-bars and feeder on the second floor above the excluder. The Alexander feeder, when properly fitted, is more convenient than the Doolittle; it does not occupy a frame space and it is more easily filled. But it is my belief that the Alexander should be incorporated as part of a combined floor board and hive stand; propping it under the brood chamber with wedges or pebbles is an inefficient makeshift. A cell starter, so made up, should be reassembled every ten days. By that time the last cell in the top story will have been capped and a fresh lot of eggs and larvæ must be placed there to keep the nurse bees upstairs. The Demaree system is excellent for swarm prevention in that it collects the crowd of nurse bees in the isolated top story away from the work of the rest of the hive; some may like to work it for cell building, but it is not for me; the impulse is not sufficiently fierce and imperative. The Demaree is more truly the impulse of supersedure; the bees in the top story will accept cells through a sense of the failure of their former queen. They will not accept caged queens, and this seems to prove that they are not actuated by a sense of queenlessness. The formula given above works on a basis of sheer overcrowding, which can be progressively increased up to an absurd and unnecessary point. It is therefore founded more on the swarming than on the supersedure impulse and has sometimes to be forsaken for a true supersedure method in the later part of the season; I have had no difficulties with it up to the end of July. In the later months good supersedure queens are the most valuable possession in the apiary, but it is a delicate business, and colonies will get tired and half-hearted in spite of everything. Even where you

clip all four wings closely the bees seem to argue, "Let her be; she won't need to fly this year."

The rate of increase in the overcrowded cell-building colonies can be controlled at the ten-day reassemblings. Here one has to consider that a new-laid egg will hatch and pass through the larval stage and become capped in nine days, but will remain in this capped stage for twelve days. Make up a cell-builder on May 1. On May 11th it will be possible to eliminate those frames which ten days ago were marked with a push-pin as being largely eggs, and which are not due to hatch until after the next manipulation, and to replace them with emerging brood from other colonies, or, if so rapid an increase is not desired, it will be possible to leave them in the lower story as heat-producing dummies. However crowded the colony, one should always remember that it is the nurse bees that are the vital element in a cell-builder. Queen breeders would welcome some simple device for periodically removing a proportion of the field bees. Where such overcrowded colonies are maintained, too large a proportion of field bees becomes a nuisance. The balance of the colony is upset; there is a scramble between the queen and the field bees for the empty cells as soon as they are vacated by hatching, and the honey collectors usually win. Then the ten-day reassemblings become almost a new make-up, or the colony will run short of the due number of nurse bees and consequently will cease to function satisfactorily at a later date when this derangement makes itself felt. A superabundance of nurse bees whose systems are overcharged with larval food is now becoming generally accepted as the true cause of swarming; the scientists are contemptuous towards loose-minded people who talk about "instinct"; they insist that instinct is merely a response to stimuli. If this hive condition is the true cause of swarming, then it is also the true impulse for cell building, and it is the golden key of the queen rearing apiary.

Why should there be any difference between a cell-starting and a cell-building colony? What is the reason for maintaining these two types? No doubt, if you get a large proportion of unaccepted cells to a bar, you will want to diminish the number of bars

down to what is necessary to hold the accepted ones. Surely the proper differentiation should be between cell builders and cell incubators. For incubating cells during the summer months an overcrowded cell-feeding colony such as I have described, is not necessary; though I certainly hold that such colonies are necessary up to the time of capping. The prejudice against incubator and brooder raised chickens has died down in the face of the winning of all prizes and contests by the "artificially" raised specimens. For a long time there was supposed to be some mysterious lack of vitality in chickens reared by the warmth of a lamp and not by the blood circulation of a hen. Today I think only a few obscure cranks hold this belief. Similarly there should be no prejudice against incubating queen cells in mechanical devices, provided that the young queen emerges from the cell into a strong nucleus, and not into one of those cages advocated by persons who ought to know better. Some of these misguided ones try to explain that the young queens are always well fed with proper food through the screen. I beg to differ; I have seen the poor things trying to gnaw the candy. And why is the candy put there? Is it solely intended for subsequent release? No, sir; you know well enough that all that batch of virgins is not going to be properly fed with glandular food through the screen, and you know that their organs require it. It seems to me that the standard of price for untested queens is set by the man who can turn out the most at the lowest cost in the shortest time, but that is a very different thing from the standard of quality.

Where to place the cell for hatching? I once amused myself by designing a frame within a frame, a miniature frame inserted in the center of the middle comb of a three-frame nucleus. This little gap was just large enough to hold a queen cell; here the cell was literally surrounded by bees and brood. Unfortunately, it is necessary from time to time to change the frames in a nucleus, and it is not always possible to keep such a frame in the middle. I do not favor wedging the cell between the top bars; here it is often isolated over a patch of honey. Neither do I favor the West protector where protection is not necessary. The best method, in my opinion, is to employ a wire note of interrogation (?), a piece of wire that shall grip the cell cup and spike into the comb wherever necessary. The important part of hatching a queen is to ensure that she shall be properly fed and groomed and fussed over on emergence and to see that the bees are given a chance to gnaw the capping and assist her out of her prison, if necessary. I feel sure that the matter of temperature is not very important in the warm summer months; I have had excellent queens hatch from discarded cells left in a shed where

the night temperature descended to 65 degrees Fahr.

Having followed the life history of the queen up to the stage where she is safely hatched and perambulating the combs of a strong three-frame nucleus, we have now to discuss the subject of mating, but this in itself suggests whole columns of further random remarks, and enough has been written to evoke pages of scornful criticism from the brethren of the craft.

Rustburg, Va.

SOW THISTLE AS A HONEY PLANT

By Frank C. Pellett

It is in the grain fields of the northwest that sow thistle is most abundant. There are areas in southern Manitoba and North Dakota where the fields are yellow with the blossoms as far as the eye can see, during the month of August. With the bright yellow blossoms, like big dandelions, spreading above the heads of the wheat it is a pretty, though discouraging, sight to the farmer. Sow thistle, together with Canada thistle, has so fully occupied the land in many places that it is difficult to harvest a crop of grain. The writer has seen the seeds floating away from the threshing machine and carried on the wind in such quantity that the air seemed filled with them and the sky overcast as though light clouds were present. With even a slight breeze the seeds are carried for miles. A careless farmer thus spreads the pest over the land for miles around, and so common has the plant become in this region that in some sections the value of

the land has been greatly reduced because of it. When the plants are in bloom the fields often give the impression, at a little distance, of being occupied with sow thistle only.

Although there are three species of sow thistle present in this region, it is the perennial sow thistle (*Sonchus arvensis*) which is most difficult to eradicate from cultivated areas. Summer fallow with frequent cultivation is about the only method. Once established it is likely to remain permanently, since there are always some plants likely to be left to seed in waste places, even with the most thorough methods of cultivation. The plant spreads by means of a perennial creeping rootstock as well as by seed. It is common from Nova Scotia to Saskatchewan, although in only a comparatively small portion of its range has it been permitted to run riot in cultivated fields to such an extent as above mentioned.

Beekeepers visited by the writer in Manitoba nearly all credited sow thistle as an important source of amber honey in midsummer. Some North Dakota beekeepers, on the other hand, doubted its value and stated that they seldom found the bees working on it. Since its blooming period is similar to that of sweet clover, it is not surprising that the bees do not work it during the bloom of the latter plant. Even though the secretion of nectar is not as abundant in sow thistle as in some other plants, where it occurs as abundantly as on portions of the northwestern prairies it is still important. Aside from the prairie provinces of Canada the writer has been unable to find any place where it is considered as an important source of surplus. Press reports credited Consul J. I. Brit-



Blossoms of sow-thistle.

tain, Winnipeg, with the statement that sow thistle was the principal plant from which Manitoba's 1,800,000 pounds of honey produced in 1922 was harvested.

The honey is of decided flavor and would be regarded as of inferior quality in markets accustomed to the light-colored product from alfalfa or the clovers.

EDUCATING PEOPLE TO USE MORE HONEY

Ideas that the Ambitious Honey Producer Can Use With Profit

By Frank V. Faulhaber

A MAN who has been keeping bees for several years observed: "The keeping of bees is an absorbing hobby. I have never regretted it since I first started the work. It keeps you pleasantly occupied, and there are always new things to learn as you go along. But one of my chiefest concerns is the disposal of my products, particularly honey. I should like to sell more honey locally, but I find I cannot canvass for prospects with the limited time at my disposal."

This man's experience is but typical of many other beekeepers in this country. Yet, while it is advisable to interest people personally in the use of honey, the beekeeper can encourage prospects to buy through other means. There is the matter of advertising, and particularly regarding this element is this article concerned. The beekeeper who will act upon suggestions herein advanced will be amply repaid for his efforts.

The first question the energetic beekeeper now will consider is: From where do I want to attract prospects? That is important. Do you want to confine your honey sales to your local town? Do you want to extend your business to neighboring communities, or even to other states? To be sure, the field is broad and the opportunities many to market good, wholesome honey. The object, naturally, is to get more people interested regarding the true values of the product. Only in that way can we hope to increase demand.

Today thousands of people are not using honey—why? **Because they don't know anything about it.** Why keep these people in ignorance, thus cutting off that much business that could easily be developed? The answer to the solution, of course, is **Educative Advertising.** And it matters not how small the town wherein the beekeeper resides, it is possible to get over your proposition. Let us discuss advertising locally, in your newspapers.

Before proceeding further, it should be said that the beekeeper must not become discouraged because big results do not follow the running of one or two advertisements. Your efforts should be consistent. Only in that way can we determine the true value of advertising. Dismiss for the time being the matter of expense involved. There are profits in the

offing. The largest, most successful businesses have built up great demands for their products through advertising. Were they to curtail their advertising appropriations the heads of these businesses would proportionately cut down their profits. Here is something for the beekeeper to go by.

Problem: How much space should I use in the local newspaper to get over my proposition? **Answer:** The ordinary newspaper column width and from four to eight inches in depth is quite adequate for the beekeeper's purposes. It is not so much a question of space as what that space contains. And it should prove to the beekeeper's profit if he alter his advertisements from time to time. When readers realize you are in the habit of saying something new all the time they will instinctively seek for your advertisements. That is something to keep in mind. Now, let us consider the matter of text.

Your advertisements should preferably be out of the ordinary, to set them apart from the other publicity matter and attract added attention. It is not wise to boast, "Our honey is the best," or merely to announce, "Honey for sale." **Object:** To tell the readers why they should use honey. Once the new customers start using your honey they will become convinced of its quality. This, naturally hints the importance of constantly interesting new prospects, prospects who have used little or no honey.

It is not necessary to use pictures in conjunction with your advertising text. If you do decide on illustrations let their purpose be more than merely to draw attention; they should be linked up with your product. The beekeeper preferably should use an attractive border for his advertisements, to make them invitingly outstanding. It is well to do a thing thoroughly here to make for the best possible results. And try to get the same position in the newspaper wherein you advertise, if at all possible.

Since the beekeeper desires to interest more prospects, it is advisable to have available small packages of honey. Bear in mind, people who have never used honey, yet are ready to be shown, will not want to gamble on a 10-pound pail. It is the trial that convinces, hence the importance of sample sizes. It is not necessary

to distribute these samples gratis, but let your prospects know you have available one-half-pound and one-pound packages. Thus we are encouraging sampling, which should result in more steady and larger users later. Let your newspaper advertisements work for you here. Particularly urge the purchase of small quantities, to bring home the real value of honey to the doubtful ones.

That advertising which is specific usually brings the best returns. Equally profitable should it prove for the beekeeper if he interests certain classes of people. Example: Direct one advertisement for the attention of old people, explaining that the consumption of honey is healthful for such people, enabling them to keep in good condition. Naturally, honey is a delicious, nourishing food for all ages, therefore this particular advertisement will drive home its message to all its readers.

Talk about sweet mouths! Consider all the people who eat so much candy, ice cream, sweet beverages, etc., opposed to those eating honey! Who cannot limn the possibilities here? Why not go earnestly after some of this business? Let us encourage the use of a little more honey and the use of a little less of other sweet products. The beekeeper here particularly should not be at a disadvantage, for his produce, honey, embraces real food value, a truth thousands of people do not appreciate. Let us neglect not our opportunity!

Honey, on the whole, is cheaper than candy; moreover, it is a natural food. Thus, in one advertisement urge: "Try Honey for a Change! Young People Like it. Both Sweet and Wholesome. A Food and a Confection in One." You might run some conversational text in your advertisements. Example: "Betty, who is such a lover of sweets, was uncertain what candy to buy. To her friend, Oscar, she said, 'I like candy, but I really don't know what kind to buy for mother. It's her birthday, and I want to surprise her.' Oscar returned: 'And you've tasted so many kinds! Why not buy her a package of honey, and give your mother a real surprise?' 'Oh!' exclaimed Betty, exultingly; 'I think I will! I know my mother likes honey. It's sweet, and she told me already that it was good for her health.'"

In the preceding paragraph we have but an illustration of advertising possibilities. Here, incidentally, it might be said that the beekeeper encourage the purchase of suitable packages of honey, through his newspaper advertisements, as birthday presents. You might direct your proposition to the children, urging them to buy honey for either their mothers or fathers. Certainly they will make a useful presentation, something that can be eaten with relish and nourishment. Let your little readers know that honey is cheap, and well worth buying for various purposes.

Many people make candy at home.

Often they desire to produce different goods. Let these people know that the addition of honey brings about new, delicious confections. Here the advertisement, of course, beckons you. And in the same way you might address those women who are always baking various cakes; emphasize the fact that new cakes can be baked by including honey. Some practical recipes should prove in time here, and if the beekeeper enter wholeheartedly into the project he will experience no difficulty whatever in creating better demand for honey.

Often people have company at the last minute. The hostess is in a quandary as to what to buy. Why not suggest the purchase of a ten-pound pail of honey, or at least a small quantity, to bring joy to the visitors? Here, of course, your newspaper advertising has its place. The honey, naturally, will prove a valuable addition to the table, and it will be the beekeeper who grasps the suggested opportunity who will realize on his efforts. Many interesting advertisements can be composed in the interest of honey; thought on the subject should hint of various others.

Then there is the matter of wedding parties. Why not confine one advertisement in the interest of wedding parties? People who have never used honey before can be induced to lay in a supply for their wedding guests. We shall cite another specimen here that the beekeeper can use. It is typical of possibilities. Illustration: Mrs. Young was just beaming her gratification; it was the day after her wedding. "Oh!" sighed she, "I was so afraid that everything would turn out wrong! You know, it was something different, something new, something that I had never experienced! Candidly, I thought everything would be a fizzle! But I had an agreeable surprise in store! All the wedding guests had complimented me for providing such good honey!! And the best part of it all is that I had used very little honey for myself before; you can count on me as a steady user from now on! Let me have a ten-pound pail!"

Through the use of your newspaper advertisements it is possible to encourage the purchase of more honey for all sorts of parties. If some young people are about to have a birthday party, you can rest assured they will become impressed by your timely suggestion here. They see. They act. You, the beekeeper, profit. As can be seen, it is not necessary at all to stick to one set argument all the time; there are many interesting ways to reach prospects, encouraging greater consumption of honey all the time.

Honey can be pushed in innumerable ways. It is a pleasing dish that will be welcomed wherever it is furnished. Just as its use can be advanced for receptions, so can the real food value of honey be brought home to prospects. Many people, as is well-known, eat things simply be-

cause they are sweet, but people should be taught to consume honey not alone because of its delicious taste. When more people become cognizant of the real food value of honey then will its consumption increase. The beekeeper cannot use too many newspaper advertisements in driving home the truth here.

The very fact that honey is known for its food value should suggest its greater use among children. Hence, why not reach, through your local newspaper advertisements, the mothers, and point out that honey should be provided for the children? Let the mothers realize that honey is something more substantial than candy; honey is never adulterated to make the child sick. To the contrary, honey is beneficial to the health! You should require but little sales-arguing here. In place of butter, honey can be applied on bread for the little children's use. It can be used in lieu of jellies and jams. Certainly for honey there should be a big place on every table.

Then, consider the medicinal quantities of honey. Who of us do not know of its purchase to relieve a cough, a cold? Yet, how many people are without this knowledge? How many more people would resort to honey if they did realize honey was good for coughs and colds? We see the possibilities here now. The next step is to make the most of our opportunity. Let us turn to our ever-available newspaper advertisements, and educate our prospects regarding the many good qualities embraced in honey. The beekeeper should have no trouble at all in interesting many people in honey because of its use for coughs and colds.

The beekeeper can reach the little children, through his newspaper advertisements, by directing his message to the mothers, explaining that honey can be given to little ones in place of the objectionable cough medicines. Surely honey will find a greater welcome than is true of medicines that leave a bad taste in the mouth. There have been many instances where honey broke a hard cold after other remedial measures had failed. There are many sales-arguments open here that, if used, will materially stimulate honey sales for every producer.

The fact that honey is good for sore throats hints of other new sales-arguments. Let us consider lecturers, ministers, speakers, etc. Many of these people use something for the improvement of their voices. Why not honey? Why cannot we induce these people to provide themselves with honey, so that they can keep their throats in condition, so that they will be enabled to speak to their audiences more easily? Who cannot vision the possibilities here? Now, let us consider the local newspaper advertisements. We can direct separate messages to each class of prospects, to make the advertisements more specific, to make them out of the ordinary, therefore making them more effective. Let the beekeeper address

the lecturer, the minister, the speaker, and others. Sales in honey will then soon jack up.

It will often react to the profit of the beekeeper if he can arrange some attractive display on the side. One enterprising honey producer ran a few advertisements in his local newspaper at the time a circus had come to town; in conjunction therewith he set up a stand on the circus ground. Here was effective publicity. By this combined move he was enabled to turn honey sales to the tune of several hundred dollars. He saw his opportunity. He grasped it. He profited. Other beekeepers can do the same.

If honey producers wish to extend their honey trade to other communities, then advertisements should be placed in newspapers and magazines reaching the desired prospects. Often you can run an advertisement in some monthly of regional purpose, in surrounding states, which will make your investment here profitable, and enable you to dispose of your entire supply. No matter what course you follow, you should experience no difficulty in getting more people to like and want your honey.

New York.

THE HUBER LETTERS

The Departure of the Swarms

(Continued from January)

July 10, 1829.

To know that you are together, my dear girls, is to believe that you are happy; will you permit me to come and talk a little while with the four of you, as if we were face to face? It is to Elisa that I want to speak at this moment and probably about the bees. Why might I not interest, also, her sister and her mother? You have probably found that I had sufficiently proved, in one of my last letters, that wax is produced from honey and especially from the saccharine part of it. I have still another proof to offer you of this fact; it will be my fault if you don't discover it.

Permit me to transport you into your own garden, and that I select, for that, one of the finest days of spring, that the air be soft and just as it should be for the exit of swarms. At that time the country is covered with blossoms; you see what the bees do; you have seen them thousands of times working upon the flowers of your gardens and of your meadows. Their humming, which I find so true, I was about to say so harmonious, so solemn, you have heard it; it pleased you thousands of times like the softest music that the ear may hear, but the gentleness of the bees is still more remarkable. Out of these thousands of stings, did one ever turn against you? Let us consult the oracle, let us see what is taking place at your home, that is in your glass hive. What disorder,

what trouble do we see there? What has become of their vaunted orderliness? I see there but the greatest confusion; every one of them passes before me with such haste that I hardly know whether they are drones or workers. Do I not see there their queen running also, passing, without looking, over the body of the workers, striking them with her legs, her head, her antennae? Her march over the combs produces upon the bees which she meets, and which she appears to address in passing, the effect of the wake of a vessel; in spite of her speed one can always see where she is going or whence she came. Am I mistaken? See, are not her workers following her? Does not the disorder, which was evidently begun by the queen as she advanced, spread around her as she goes? Wherever she goes, is she not followed by those which her racing have excited? Yes, for their number diminishes upon the comb on which she was a moment ago, and she is now on the other side of the same comb, after having given them the signal of departure.

Second act. What do I see? What has become of that comb full of the finest honey, a few minutes ago? At present, nearly all its cells are empty. That is also what the queen ordered and wanted. But let us see better, if possible. Let us go to another hive which is in the same condition and also has a swarm to cast, especially one the last comb of which is full and glassed. The work of emptying the comb is already well along, many cells are only half full. But there is enough left to see what will happen when their turn comes to be emptied.

Preparation for Departure

I have regretted, often, not to have found in my hives many cells which permitted of observation as fully as those which you saw lately, one of the sides of which, being glassed, permitted to see the inside, in which a worker should have her head thrust. In the case in question, we saw many cells full or half full and as many workers with their heads into them. The speed of their motions was noticeable, but as to what they did we could only judge by the disappearance of the honey with which they had been filled.

Those bees, after having gorged themselves, had really changed in shape, their abdomen looked like a little barrel and we could have recognized them at the door of their new home.

I will repeat here that honey is the primary substance of beeswax. The bees, caught in the act, as I have caught them every time that I have attempted it, have led me to the same conclusion.

(Note.—Those of the readers who may be astonished at Huber's insistence upon the subject of the origin of wax should remember that very few people believed him at first and that there are still many people who imagine that it is made out of pollen.—Translator.)

Far from being proud of this discovery, I am sometimes ashamed of not having made it sooner and even not to have guessed it. Such fine work could not be left to the hazard of rain and sunshine.

Behavior of the Queen

The behavior of the queen, when she reaches the moment when the fear of her young rivals becomes strong enough to induce her to leave her hive, shows that another idea possesses her, and this is not the least astonishing point which her history presents. She remembers that she is a mother and appears then to think of it for the first time. I tried to describe to you this unique being in the delirium of fear, occupied only with the danger which threatens her and with the means of escaping from it. Her actions and especially their outcome do not permit to doubt that another care absorbs her and possesses her almost entirely: that of giving life for the second time to the numerous children with which she is surrounded, who must follow her and be led with her to a new abode. But let us forget her for an instant, let us think rather about that maternal instinct which has been awakened so marvelously and opportunely. Look about you, in your own heart, dear Sophie (1), the answer will not require waiting:

Si Dio veder to vuoi
Cercalo in ogni oggetto
Miralo nel tuo petto
Lo troverai con te.

If you wish to see God
Seek Him in every object,
Admire Him within you,
You will find him with you.

(1. Sophie is Mrs. Portes, mother of Elisa.—Editor).

Let us examine what would have happened if the bad principle in which too many believed should have a part in the government of the universe, with the father of nature acting as by blind hazard; it might have cancelled the law of the bees' code, of which we have just seen one of the finest applications. The bee's species, barely called to existence and happiness, would have had but a moment of life; all the beings which accompany the queen, finding the new hive absolutely destitute of all the necessities, would soon have undergone the horrors or famine, having not brought any honey with them nor constructed any cells of wax; the queen's young, finding no cradles to receive them, would have perished at birth or before birth; long ago the industrious family would have ceased to exist; it exists, however. Sorry hazard did not preside. Before being great philosophers, let us begin by seeing that which we can enjoy, and being thankful for it, it is, in my mind, the best philosophy.

Elisa may also conclude, from the picture which I placed before her eyes that a language appropriate to their needs and to their organization has been granted to the beings which are placed upon the different rounds

of the animal scale, and especially to those that live in association. This language is not boisterous among the bees, any more than among the mutes of our own species. The antennae are the organs of it among our favorite insects. Their dictionary is more or less abundant, doubtless the flexibility of the organ allows of much variety in the degree of force, as well as in the direction and speed of its touch. This expression, through which a skillful musician imparts to us what she thinks or what she feels and which tells more than voice can do, could she not furnish it as well at the foot of the scale as in the highest regions? I have often heard you say to me, dear Sophie, upon your keyboard, that which was not written upon your music book.

(To be Continued).

SPREAD FOR BREAD

By John T. Bartlett

Some months ago the writer told in the American Bee Journal of a honey and plant product being sold by W. S. Sanderson & Bro., of Denver—"Honey-Nut Butter." This company operates two food specialty stores in Denver—teas, coffees, extracts, nuts, etc. When the writer broached to Mr. Sanderson the possibilities in wholesaling of the new product, he was not optimistic, saying margins were small. The Sanderson firm, of course, is strictly a retail enterprise, and wholesaling is "not in its line."

The spectacle of his own children showing strong partiality for a honey-peanut butter mixture over a period of months—peanut butter alone no longer interests them—has convinced the writer there are really great commercial possibilities in a honey and peanut butter product. He has been pleased, therefore, to learn recently of a product of this sort which is being wholesaled and retailed in the East. It is put up in 4, 8 and 14-oz. jars. The packer is C. H. W. Weber & Co., of Cincinnati, Ohio.

Louisville, Ky., advertising which the writer has seen describes "Honey-Peanut Preserves," as the product is called. It is said of it:

"A well-balanced food. Everybody must have heat, energy, and rebuilding materials; these are obtainable from fats, proteids, carbohydrates and minerals in foods.

"Honey-Peanut Preserves, made of pure honey, choice peanuts, peanut oil, is a well-balanced article of diet containing the right proportion of fat, proteid, carbohydrates and mineral, is very nutritious. Five times sweeter than sugar, 50 per cent fatter than pork. 'It's a good spread for any bread.'"

Honey-Peanut Preserves is advertised in Louisville as for sale "by all good grocers."

What Honey-Peanut Preserves is exactly like, the writer does not know, neither does he know what

success is being met with by the enterprising people who have put it on the market. However, he is quite willing to risk his reputation as a prophet on the future of some honey product—he does not say just what—in the “spread for bread” field. Private enterprise, or comparative enterprise, may take some time to get behind a “spread for bread” product, but commercial enterprise eventually will get behind such, and develop a great opportunity.

Candied honey, which Mr. Skovbo has been putting up and selling in pound packages, certainly seems eligible. A spread made of a combination of honey and peanut butter is another eligible. These two, either or both of them, can be promoted to tremendous national consumption. To believe this, one has only to give either product a tryout in average families, see how various members, particularly the little folks, take to them, see what great lunch-pail articles they make, then consider economic conditions in the “spread for bread” field.

Butter is high in price, and undoubtedly due to remain high in price. No survey of agricultural conditions suggests that butterfat supply can be depended on to permanently reduce butter prices to lower levels; on the other hand, it is quite apt to go higher.

The rise in the price of butter finds a large part of a nation casting about for a “spread for bread” substitute, taking the place of a portion, at least, of normal former-times consumption of butter.

Thus oleomargarines have had a spectacular increase in per capita consumption. Many families are using much more jelly and jam than before. Against the margarines there is much popular prejudice, also persistent and undoubtedly permanent dairy agitation. It seems fairly certain that as a spread for bread, dairy butter will permanently and perhaps on an increasing scale, share its function with other spreads. What will be the stabilized condition, no one can exactly foresee.

With proper educational promotion—such is very essential—it seems reasonable to suppose that a honey product, such as either of the two mentioned, can become a “spread for bread” which will add greatly to per capita honey consumption. The educational effort with the public is, however, necessary. Considering he had a product new to the public, Mr. Skovbo certainly reported very encouraging results with his packaged candied honey. Were it possible for the whole honey industry to get behind a standardized package of candied honey, in the manner that the California raisin industry got behind its now-famous 5c package, there can be no doubt whatever, the writer believes, that it could be promoted in a short time to tremendous national consumption.

All these things merely emphasize the fact that the honey industry, commercially, is on the threshold of great possible expansion.

GETTING PUBLICITY FOR BEE-KEEPING

By Robert S. Merrill

Readers of daily and weekly newspapers are glad to get interesting material about bees and honey. A survey of a large number of newspapers from all over the country about the time that a half interest in Achievement Girl was sold for \$150, revealed this.

As I went through different papers I found that a great many editors were led to comment upon the unusual idea of a queenbee bringing \$300. Country weeklies, city dailies and even the financial papers found the transaction thought-provoking.

“In view of the fact that her children have been world-beaters as honey-producers,” remarked the Chicago Journal of Commerce, “the price does not seem to be excessive. Bees go out and gather sweets for those who house them and unusually industrious and productive ones may well have high individual values placed on them by their owners. It's all a matter of service—the better and greater the service, the higher the value.”

“Bees or man, it's just the same. The bee is after the honey, the man is after the bacon. When either gets home with the goods he establishes his economic value.”

“The frenzied finance which played the mischief with the breeding of blooded horses, cattle and swine just after the war, seems to be reviving in an unexpected quarter,” said the Evening Journal of Chicago, commenting upon the sale of the bee. “Not much, to be sure, compared to \$100,000 for a prize bull and similar prices for a boar, but enough to prompt the question as to whether the amount paid is speculation or investment.”

“In one way, the sale of this queen bee is a good sign. It is evidence that scientific interest is aroused in a hitherto neglected field of husbandry and source of food. The queen may be worth all she is rated at, and more, as a producer of honey gatherers. But, remembering the harm done to the pure-bred industry by inflated prices, one feels inclined to hang up a sign of warning.”

In the Leesburg, Fla., Commercial I found the County Agent devoting a portion of his column on “Farm and Grove Suggestions” to urging the use of more honey, because of its pure sweets. Not only more was advised, but we advise all our friends to do the same, knowing that we are thus to secure better health and longer life. That portion of his column devoted to “Eat More Honey” had a good closing, one that will linger in the minds of the readers, because it has a rhyming tendency:

“Sweeten up, and keep sweet with Florida's pure honey;
‘Twill give you health, that's more than wealth—
Worth more than all your money.”

Beekeepers generally are too close

to their work and too familiar with the process whereby honey is secured to realize that there is a fascination in them for the average person. If you can get a competent newspaper reporter near an exhibit or near the apiary and begin to explain some things to him, the chances are that nine times out of ten he will want to write something about it. He realizes that it is interesting material. This is especially true where newspapers have a large circulation among farmers or print farm news on certain days each week.

In Texas, the Galveston News and the Dallas News publish farm editions twice a week. A staff writer for one edition chanced to see the exhibit of the Texas Honey Producers' Association at the State Fair and began to ask questions. As a result, he wrote an article that took up the better part of two columns. It was headed “How Machines Do Part of the Work of the Industrious Bee.” The writer told of how aluminum combs are used, how queenbees were raised for sale and the details of honey-making as told to him.

Another writer described the advantages of farming in east Texas for beekeeping and used a picture of an apiary near Shelbyville as one of the three illustrations for the two-column article regarding east Texas farming in general.

Undoubtedly there are many human interest stories about bees that could be published in local newspapers and which would do the beekeeping industry some good. The difficulty is to dig them out. The beekeeper is too close to his work; he is not a newspaper man and could not be quite sure what would interest the public.

But as I have said earlier in this article, few good newspaper men could not be around a beekeeper who knows his business without hearing something that would make him want to write an article of some sort about it. Therefore, the most logical thing to do is get acquainted with the men on the newspapers and gradually interest them in bees and honey until they themselves suggest that they want to write an article.

And if an article is not out-and-out advertising there is little doubt but that it will be printed.

Illinois.

DOES BEEKEEPING PAY?

By H. Pearson

I wish to take exceptions to Mr. G. F. Marsh's letter in the December American Bee Journal, page 565. He says that it will cost \$50 per colony, and at that figure 250 colonies will cost \$12,500, and the average yield is 90 pounds, and that it will take 10 per cent for interest and depreciation, and selling the honey at 10c per pound, which would leave the caretaker \$1,000 for his year's work. He surely paints the bee business pretty black. We will take it for granted that his statements are the truth; if he should pay any such

figure as the above they must have "seen him coming" and calculated that they had something on a hook, as there is a 300 colony apiary with a full equipment offered for sale at \$4,000, and 90 pounds per colony will amount to 27,000 pounds, at 10c per pound will bring \$2,700; 10 per cent on the investment will be \$400, which will leave the caretaker \$2,300. Now we will call the increase 33 1-3 per cent, at the same price as the original colonies; they will be worth \$1,333 1-3. Now we will have some wax to sell, we will buy bee journals and books with the odd 33 1-3 dollars and the wax, leaving \$1,360 to be added to \$2,300 will be \$3,660. We are going to take \$600 and spend the winter in Florida, leaving \$3,000 for our year's labor. I don't figure that a bad salary; it would not be for me, and I can do the work. Mr. M. placed his figures 200 per cent too high, and he forgot to say anything about increase and wax, which I have placed very low.

Furthermore, if I had a \$50 colony apiary and I couldn't make them average more than 90 pounds, I would go to the doctor at once.

Mr. M. must have been looking through the wrong glasses when he placed such figures before the beekeeping fraternity.

Wisconsin.

TWO OF UNCLE SAM'S APICULTURISTS

By G. H. Cale.

It helps us all to become better acquainted with others engaged in our profession, especially those whose work is typically different from that which we do. The work of the Federal Government is so well established and so worth while that we could not get along without it. Few of us realize, however, what are the daily tasks of the men who carry on this work. Let us here become acquainted with two of them.

The Bee Doctor.

Such is the title which best fits the personality and profession of A. P. Sturtevant. Beekeepers are to be congratulated that a vaunting ambition does not remove him to a field of wider application for his talents, but he is apparently devoted to the problems of bee diseases and behavior and will continue to add to our knowledge of them.

Sturtevant is a trained bacteriologist and to go into his laboratory is to enter a world of technical materials which confuse the ordinary man. Yet, when he begins to talk about sick bees, one sees the strange apparatus gradually become explainable and gets an insight into bee disease which comes from the intellect of a master worker in this field.

He has many experiments under way to find out new facts and to bring them from the laboratory out into the everyday practice of the beekeeper. It often seems strange, to one who does not understand, why



A. P. Sturtevant, the "Bee Doctor."

those who work at scientific jobs like this do not give us quicker knowledge and more of it. It is only our ignorance of the nature of investigation which makes the results seem so few. There is no work which requires more care and proof than scientific investigation and the wonder is that the investigators have so much material constantly to give the world.

Of one thing beekeepers may be sure. Sturtevant knows his task and will give results that can be counted on with absolute certainty. He is one specialist we can not get along without.

Our Cosmopolitan Apiculturist

We may call him ours, since he is one of Uncle Sam's right hand men.



E. L. Sechrist.

Without E. L. Sechrist's daily presence, the Office of Bee Culture, at Washington, would be without that which makes it run so smoothly. He takes the entire load of daily details from the shoulders of the rest of the workers so that they may go to their appointed tasks without interruptions.

To do this well one must be a cosmopolitan and Sechrist truly is a citizen of the world apicultural. He has kept bees under the four suns—in Africa, in Tahiti, in the Eastern United States, in California, in Haiti and the Dominican Republic, and perhaps other places; we do not know. And with it all he has brought into use a keen intelligence which efficiently absorbed the fundamentals from each experience. Uncle Sam and "us beekeepers" are fortunate in having him in the service.

His job is manifold. Much of the general correspondence from beekeepers seeking help and answers to their questions receives his personal attention, unless it be of such a technical nature as to require the training of a specialist in its answering. Such letters are properly referred by Sechrist to the other specialists so that the inquirer may have the best possible aid. Practically all the many details of the established annual routine of administration also pass through his hands. He is, in reality, a clearing house for all that comes or goes from the Bee Culture Office.

That isn't all. He prepares manuscript, makes reports, manages the Government apiary, and contributes much to the research work which is constantly progressing towards the solution of problems in beekeeping.

And yet they say that one holding a Government position has a "cinch." Ask Sechrist.

FEED IN WINTER

By F. B. Paddock, Ames, Iowa

FEEDING weak colonies of bees has been practiced from early times. Yet we read in modern literature the following: "If one has been so careless as to have bees that are in need of stores, at the beginning of winter, we would advise frames of sealed honey—" And, "the prudent apiarist will regard the feeding of bees . . . as an evil, to be submitted to only when it cannot be avoided."

Without doubt, the feeding of sugar syrup should be discouraged except as a measure of insurance against the loss of a colony. However, there are instances when good intentions do not make up for the absence of a fall honey flow, and some colonies may be found which are too light to winter successfully. The loss of a colony should be avoided whenever possible. It may so happen that a weak colony will have a queen which one is anxious to save for the next season. To what extent feed may be given in the cellar

was the reason for the following observations:

During the season of 1921, Colony No. 22 made a good record, although the queen was completing her second season of production. At the end of the summer honey flow the colony was rated as excellent, but during the fall the colony did poorly, and very late it was discovered that the colony was greatly under weight. After October 27, some feed was given but, due to the cold weather, but little was taken up, so the colony was placed in the cellar quite deficient in weight. This colony was placed in the cellar on November 23.

On January 10, two and one-half ounces of honey were given in a pail lid, placed in the entrance. This honey was cold and the cellar temperature was 45 degrees F., with the humidity of 46 degrees. No bees were in sight at the time this honey was given. No observations were made after 8:30 p. m., when the honey was given to the colony. The next morning, all of the honey had been taken up and no bees were in sight. Again, on January 13, 2½ ounces of honey were placed in a lid at the entrance of the hive. The honey this time was heated to a temperature of 85 degrees F. No bees were in sight when the honey was given to the colony. The temperature of the cellar was 42 degrees F., and the humidity was 61 degrees. The honey was given at 4:30 p. m., and at 5 o'clock the bees were busily engaged in taking up the honey. By 7 o'clock all of the honey was gone and another 2½ ounces were given, which was in turn taken up by 9 o'clock, when another 2½ ounces of warm honey were given to the colony. From 7 to 9 o'clock the bees of the colony were quit active, probably being stimulated by the presence of the warm honey. On January 14, 6 ounces of honey at 80 degrees temperature were given to the colony when the cellar temperature was 48 degrees, and the humidity 67 per cent. The honey fed at 5:50 was gone in 30 minutes, and another pan was given at 6:20, which was in turn taken up by 7 o'clock a. m., when another lot was given, and also another one at 9 o'clock. On the following day, three lots of six ounces each of warm honey were given to the colony between 6:30 and 9 o'clock. On the 17th, with the cellar temperature of 40 degrees and the humidity of 62 per cent, six ounces of honey were again given to the colony. The honey this time was not warm and the bees did not work at it. On January 19, six ounces of honey at 80 degrees were again fed at the entrance, and was taken up very readily on three occasions between 5:30 and 9 o'clock. During this time the cellar temperature was 15 degrees, and the humidity 59 per cent. On the next day one lot of six ounces of warm honey were fed to this colony. From the time that the bees were placed in the cellar until the first feed was given, the scale colonies lost one pound. During the entire cellar period the scale colonies

lost 12½ pounds. This colony No. 22 weighed eight pounds more when taken out of the cellar than when put in. During the season of 1922, this colony was a good average colony, but was re-queened at the end of the 1922 season.

Colony No. 14 started the season of 1922 as a three-pound package. It developed nicely during the season, storing an average amount of honey, and in the fall, with the exception of stores, was classified as an average colony. The stores were known to be light when the colony was placed in the cellar. This colony was given the feed as outlined for Colony No. 22. When taken out of the cellar Colony No. 14 was found to be 7 pounds heavier than when put into the cellar. During the season of 1922 this colony gathered more than the average amount of honey and was considered a good colony at the end of the season.

In view of the above evidence, it would seem that there is every reason to recommend feeding light colonies in the cellar, especially when it is likely that a good queen will be saved by doing so. Throughout the feeding, these colonies did not appear to be over-stimulated. It was evident that the colonies were not attracted to cold honey. There are conditions when it will probably be better to feed honey in the cellar rather than to attempt to make up all of the necessary stores by late fall feeding.

THE NEHALEM BEESWAX

Report of Professor Diller. of the U.
S. Geological Survey, U. S. G. S.
Washington, D. C., March
20, 1896

TO the readers of The Oregonian an apology is due for bringing up so trite a subject as the above, and yet, in palliation of this offense it should be said that the investigation, if not this report, was made by request. Among the duties assigned to me while making a geological reconnaissance of northwestern Oregon last summer, was to discover the mode of occurrence and distribution of the wax which, in at least one case, has proved to be of economic importance.

Most persons have regarded the wax as evidence of an ancient wreck of a Japanese junk on the coast near Pt. Adams, and it is only necessary to mention the names of Belcher, Victor, Davis, Brooks and especially of Davidson and Wickersham, to recall to most readers what has been written from this point of view.

In 1893, Mr. C. F. Pierson, of Portland, sent some of the matter to the National Museum at Washington, D. C., for identification, and Mr. G. P. Merrill, who examined it, published a notice in Science, January 16, 1893, stating that the samples were of a "material closely resembling, if not identical with, beeswax," but

asked for further information. He was fully informed by Mr. James Wickersham (Science, July 7, 1893), of Tacoma, who stated the facts concerning its distribution, and stated what is known of the wreck. Mr. C. D. Hiscox (Science, July 14, 1893) regarded the legend of the wreck as absurd and, apparently without having seen the material in question, pronounced it mineral wax, such as has long been known to be of considerable importance in various parts of the world.

At first thought, nothing would appear to be easier than to distinguish beeswax from mineral wax (ozocerite), and yet I am told that if well selected ozocerite be placed before bees they will use it for their honeycombs. This does not necessarily prove a great resemblance between the two substances, for in Utah bees may be glad to take anything they can get. However this may be, it is more to the point that an expert, who is familiar with such deposits in Utah, upon seeing the material from Nehalem, pronounced it ozocerite. It will be seen, therefore, that there is good excuse for studying the material and its distribution with care. If it is ozocerite, it may prove to be of no small economic importance to the State of Oregon.

During a trip from Astoria southward along the coast the only place where we found fragments of the wax was near the mouth of the Nehalem. At this point it occurs buried in the deep sand, just above the present high tide limit. From the accumulated sediments of the river, the beaches gradually growing seaward, and not many generations ago the sea reached the place now occupied by the wax. Mr. Edwards, who was my guide at the place, showed me the stakes marking the areas already dug over by himself in obtaining almost three tons of the wax. It was found in the beach sand within ten feet of the surface. He expected to continue work later in the summer, but regarded the locality as almost "mined out." We picked up a number of small fragments, coated with sand, and he showed me others previously collected. Among the latter were several short, cylindrical, hollow pieces, like candles from which the wick had disappeared. A few larger pieces, weighing from 50 to 75 pounds, were found some years ago by Mr. Edwards and also by Mr. Colwell. They bore marks apparently of trade. As the large pieces had all been disposed of, I was unfortunately not able to study the marks. The beeswax had been found some miles up the Nehalem River, but always, so far as I could learn, close to the high tide limit. From Nehalem beach it has been spread along the coast northward by the storms of winter, and southward by the strong beach breezes of summer, for many miles.

There are two coal fields on the Nehalem, one in Columbia County, east of Veronia, and the other in Clatsop, near the mouth of the river; but nothing whatever in connection

with the coal in either field resembles the wax, and it is evident from the location of the main body of the wax that it was not derived from the adjacent land, but was transported in a body by the sea and dumped not far from its present position.

As the result of a notice published by The Oregonian in August last I have received many letters concerning the wax. The following marks have been reported:

The first was 5 inches high, the fourth and fifth were about 3 inches. One would expect Japanese goods to have Japanese stamps, but in these marks there is nothing which the Secretary of the Japanese legation, or other good judges of such matters, could recognize as suggesting Japanese origin. It does not follow, however, as suggested by Prof. O. T. Mason, of the National Museum, that the wax did not come from Japan. It might have been stamped with a monogram or trademark of the individuals to whom it was sent.

Its mode of occurrence and marks clearly indicate that the product is not a natural product of Oregon, but they do not prove that it is wax and not ozocerite brought from elsewhere. The two substances, although similar in their general composition, are readily distinguishable by chemical tests. Mr. H. N. Stokes, one of the chemists of the U. S. Geological Survey, to whom it was referred for examination, says: "The substance in question is sharply distinguished from ozocerite and other paraffins by its easy decomposition by warm, strong sulphuric acid, and by being saponified by boiling with alcoholic potash, giving soaps which dissolve in hot water, and from which acids throw down insoluble fatty acids. In view of this behavior the material is evidently wax and not ozocerite."

Its melting point, determined by Mr. Stokes, is 147 degrees, which corresponds to that of beeswax, and distinguishes it from wax of other kinds known to the trade.

HOW BEES CONVEY LOCATION OF NECTAR AND HONEY

By A. R. Graham

A bee may be snared afield from a flower and caused to load with honey. This is often done by hunters of wild bees in order to get a "bee course." Before a good reliable "course" can be established it is necessary, not only to secure the return of the snared bee, but others should come in sufficient numbers that the bait may be moved while some are loading.

The hunter expects the return of the snared bee and others if the conditions are right, such as colony strength, distance, etc. We feel sure that other bees come, as a result of the snaring of the first; but how do they learn the location?

I do not believe there is any direct communication. Other bees get the idea indirectly, principally by move-

ments, though scent may help out to some extent, when the snared bee gets honey on its feet and wings.

Actual observations show that the snared bee makes a few trips to the bait alone, then one or two others come darting around, not far behind the first, which now settles down without any hesitation.

As stated above, I believe that movements are the principal means by which others of the colony get the idea of the location of the honey. The movements of the snared bee are somewhat as follows: She comes rushing in with her load, which is deposited, then out to soon return with another. Greater haste is displayed with each succeeding load, until others take notice and follow, realizing that some honey has been found. Those that follow do so wholly by sight, which I believe to be much more powerful than is commonly believed. They follow along two or three hundred feet behind and drop down where they last saw the leader. But here is where trouble begins for the pursuing bee; the initial one, having the bait well located, settles at once. Those following have a good general idea of the location, which is all that is necessary with a patch of flowers; but honey being an exception to the daily routine, is more difficult to locate.

Texas.

DIE EUROPAISCHEN BIENEN (APIDAE)

By G. E. King, University of Illinois

Die Europaischen Bienen (Apidae), Das Leben und Wirken unserer Blumenwaspen, etc., is a contribution to "Bee Literature" by Prof. Dr. H. Friese; published by Vereinigung wissenschaftlicher Verleger, Berlin and Leipzig, 1922. It is a work of over 451 pages, in seven parts, having 100 illustrations and 33 colored plates.

The author has given in a terse form the general scheme of the invertebrate group of animals, showing the position of the bees in relation to other creatures. He classes bees as solitary, social and parasitic. The honeybee is the most highly specialized and most important of the social bees. There are about 12,000 described species of bees in the world (2,500 in North America). The majority of them have a life cycle of one year, a few longer, and some two or more generations a year. The honeybee is the single type which remains active the entire year (living within the hive during winter).

Attention is given to the general structure of bees, including their organs of special sense and their vestiture, the possession of which enables them to carry on their life processes. Their geographical distribution, bird enemies, importance in the economy of mankind, and role in plant breeding are presented.

Reproduction, including the arrangement and kind of nest, food for the young, the peculiarities of cer-

tain species, and their relationships biologically and structurally, have been treated and supplemented by a discussion of the effect of the odor and color of blossoms on the bees. Descriptions of many of the species, their mode of dissemination, parasitism, and other relations have been given considerable attention. A chapter on the collection and preparation of material for educational purposes adds an unusual feature to the work. A bibliography has been included.

BEE KEEPERS BY THE WAY

A Northern Hustler

G. M. Newton is a business man and a beekeeper. As credit man for a large commercial concern in Winnipeg he is mighty busy. He has a delightful home overlooking the Red River at Selkirk, Manitoba, quite near to the old Hudson Bay Company, Fort Garry. Fort Garry was headquarters for matters of government for all the northwest country for many years, but that is outside our story. Newton has a big apiary at home and others further up the river. At his St. Peter yard he has 240 colonies, which gives some idea of the amount of bee pasture within reach.

Beekeeping serves as a diversion for Newton's regular business, but he carries it on a scale which many men would regard as a goodly business in itself. Two men are employed by the year to care for the bees and Newton gives his personal attention also on holidays and at such times as he can slip away from business affairs in the city. He is President of the Manitoba Beekeepers' Association, which is one of the liveliest of the live organizations.



G. M. Newton, President of Manitoba Beekeepers' Association.

TAKING A SWARM FROM A CHIMNEY

By Peter Petersen

The article by George Gilbert in the December issue of the Bee Journal, page 562, recalled to my mind how I took a swarm from a chimney two years ago. It was about July 1, and the colonies that I kept for comb honey threatened to swarm. As the clover honey flow was about over, and I wanted some increase, I decided to let them swarm and got some hives ready for them. One hot day a swarm came out about the middle of the forenoon and settled in the top of a large apple tree. A 16-foot ladder was placed against the branch just below the swarm and I went up and cut off the end with the bees, lowered them to the hive standing below, and in half an hour I had them placed in the apiary. In about an hour another swarm came out and settled on top of the ladder and the nearest branches. I started to cut off some of the branches to carry them and the bees down to a hive, but the swarm arose and started off. I could not follow it, because it crossed several corn fields, but soon found that it had gone down an old chimney on a neighbor's place. The swarm was not large, but it had a young Italian queen and I had a queenless colony at home. So I took a bottom board with a bee escape in the center, set a hive with drawn comb on it, and fastened it, took it over to my neighbor and got his permission to work on the chimney (which was on an old house not in use). The top was broken down and some of the bricks had lodged inside. A year or so before, a swarm had entered and partly filled it with comb, but died in the winter following. First I took down enough brick to make the top of the chimney level and apparently solid. Then the hive was placed on top of this and all openings closed with strips of cloth and the hive was left that way for a week. When I came to get the swarm they had dug out through the old mortar and were busy at work. I had just given them a cover for the chimney!

Next I tried smoke from below, but could not force it through to the bees. However, I was determined to have the swarm, so I went home and got a half-inch pipe about 5 feet long, and a bottle of crude carbolic acid. Thus prepared I went up again, removed enough bricks to make the top of the chimney level with the roof and set the hive with entrance on the edge of chimney. Then I took the 5-foot length of pipe and tied a small piece of burlap loosely on one end and pushed that end carefully down one corner of the chimney until I was sure it was below the bees, lifted it a few inches to slip off the burlap, and poured about 4 ounces of carbolic acid down through the pipe. As the weather was warm, the fumes from the acid soon brought the bees out on top, where a little smoke herded them into the hive. In less

than two hours they were in the car and on the way home, where they were united with the queenless colony. Perhaps your readers may find this useful in removing swarms from chimneys or hollow trees.

Audubon, Iowa.

THE SCABS IN SELLING HONEY

By R. Diemer

Mr. Frank E. Dennis asks in the December number, page 573: "What is a scab?" but does not answer that question. If a person who undersells another is not a scab, what is that person? The Federal Labor Board is right in saying that everybody has the right to work; likewise everybody has the right to sell his honey at any price, but every right thinking person has the right, too, to despise persons who undersell others or take their job.

I personally do not despise anybody, but pity persons who have not brains enough to see that by underselling they not only hurt themselves, but the whole industry.

I often wonder what is the trouble: In producing a crop of honey most beekeepers show intelligence and brains, but when it comes to selling that crop, many act like fools, get rid of it at any price as soon as possible. They are going begging from one grocery store to the other, offering their honey (that would easily bring them 8 or 9 cents per pound in ton lots) at 10 cents, put up in any container the grocer may choose, pint jars, quart jars, 5-pound pails, etc. How those fellows manage to replace the worn-out tires on their "flivvers" I don't know; certainly I could not do it at such prices, much less could I replace a worn-out car. The best of it all is, the same grocers who sell honey at 65 cents a 5-pound pail, sell syrup at \$1 per 5-pound can. The absurdity of these conditions does not strike my brother beekeepers; if you tell them they should ask a better price and put their honey at least at a level with syrup, they answer: "But what can you do if he will not pay more?" Working hard the whole year to produce a crop, and then let another man set the price of it below producing and distributing cost, would not work with me. It is harder for me to sell my cheap honey at 15c per pound than it is to sell my good honey at 20 cents per pound in 10-pound pails. The only way to get a better price is to ask it; if you do not keep up your price, nobody else will do it for you. Be not afraid of the scabs; their honey will go in time, and yours will not spoil.

Chico, Calif.

HONEY IN AUTO RADIATORS

Here is another testimonial concerning the use of honey in keeping radiators from freezing. It was sent to us by Mr. L. Kronmiller and is taken from the Powell, Wyoming, Tribune. Powell is at the 45th degree, in the northern section of Wyoming, a very cold country in winter:

"That the honey raisers of the Powell flat may find a new market for their product appears likely if any credence is to be placed in the reported statement of Dr. Earl Whedon, who claims to have found that the use of strained honey in the radiator of the motor car is proving a good substitute for alcohol.

"The doctor is thorough in anything he goes into and under his plan he uses equal parts of strained honey and water, affording a pliable mixture which circulates through the engine and does not freeze when the car is left outside in the cold. He states that it is a more lasting mixture than alcohol and water, as it does not allow the engine to heat up to such a degree, and there is no evaporation.

"Inasmuch as the doctor, who has several hives of bees, took the comb honey and strained it by boiling he believes that those who buy the refined honey had better use about two parts of honey to one part of water. The original cost in this would be about the same as alcohol, but the fact that it boils at a temperature of 220 degrees while alcohol will boil at 180, means there is less evaporation of the water, and the engine does not become heated so easily. He states further, that when the need comes to put in more mixture, it will only be necessary to add the water, as the honey does not evaporate.

"The doctor has been using this honey mixture so far this winter without any sign of the cold having affected it."

BEES EXTRAORDINARY

By Albert R. Rice

I had a swarm of bees about June 15. It had a queen that was clipped. I did not notice them until they were well out in the air. I went out to find the queen, and after looking for some time, I found her crawling about eight feet from the hive. The bees went back into the mother hive after about fifteen minutes and the old queen was run back with them. I at once removed all queen cells and left them as before. About seven days later they swarmed again. I was by the hive soon after swarming began. No queen was found. They sent out a very large swarm, went about 40 feet away and alighted in the top of a maple tree more than 30 feet from the ground. I waited to see what would happen. I knew the old queen was clipped and, unless I had missed a cell when I went through them before, they had no young queen. We waited about three hours, and they stayed in the tree apparently contented. I called a neighboring bee friend of mine in, and we together concluded they had a queen in the tree. We at once made preparation to take them down, and found, when we shook them to the ground and tried to hive them, that the old clipped queen was in the top of the tree with the swarm. We hived them separate-

ly this time, and it proved that she was the only queen they had, and that swarm made a hundred sections of comb honey, well filled, besides filling the entire lower hive with combs from foundation.

But the wonder to us all was how that queen ever got into the top of that tree. There is no question about

her being clipped, and no question about her being in the top of the tree, for we shook her down, caught her, and put her in the hive, and she could not fly. I do not even offer a suggestion, unless somehow the bees carried her there.

Iowa.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

Winter Losses

At my home yard, during the winter, I have lost 55 per cent of my colonies. On the 1st of September they were all in good shape; plenty of stores and eggs, brood and bees in each one. Under such conditions I expected them to winter well. A great many muskmelons are grown here and during September the bees were thick on over-ripe melons. I am inclined to believe that the bees have stored that which they got from the juice of such, and consequently suffered from diarrhea.

Kindly tell me if you think this has been the cause of my big winter loss. COLORADO.

Answer.—Yes, I believe you are right in your surmise. At any rate, if the bees died of diarrhea it is very probable that the cause can be traced to this food.

We lost the largest percentage of bees during the winters following seasons when the bees worked upon cider or damaged grapes. In nearly every case, that juice soured in the cells.

Basswood

You are right on page 437, November American Bee Journal, when you say basswood honey will flavor a large amount of other honey, but you ought to have gone a little further and said that basswood honey would spoil all the honey that it flavored. I buy thousands of pounds of honey every year, besides what I get from my yards, and I would not take basswood honey as a gift and supply my trade with it, for I could sell it just once, and then I would not have any customers. NEW YORK.

Answer.—Yes, of course, the man who knows nothing about honey would probably accuse you of adulteration when he tasted that basswood, but the expert does not object to a slight flavor of basswood, although it does not take much to give too strong a flavor. I remember having had four barrels of pure basswood honey in my cellar which was so strong that it would make one sick at the stomach to remain long in the cellar. Yet the odor is rather pleasant, but like many perfumes, it is best when faint.

Too Much Pollen

I find that bees gather a large amount of pollen, here in the South, and sometimes have 2 or 3 combs entirely full of it. What can we do with this? How can we do away with it? ALABAMA.

Answer.—We have never had too much pollen, in the Middle States, and we doubt whether it is more than an accidental occurrence when bees gather too much pollen in the South, except, of course, when a colony is queenless for a number of weeks and has no brood to feed. But thinking that conditions might be different in southern states, we referred the above question to our old friend J. J. Wilder, at Waycross, Georgia. Here is his reply, which shows us that our own views apply to the South as well as to the North of the United States:

"It sometimes happens, in certain sections in Dixie, that bees gather a large amount of pollen, due to the fact that certain plants produce a lot of pollen at a time when there is but very little honey coming in.

When corn is in bloom bees will often do this. We have several varieties of heavy yielding pollen plants.

In all cases this great supply of pollen rapidly disappears and along late in the summer it has been used by the bees in brood rearing.

I deem such combs, filled with pollen, of great value, and would not take anything for them.

Again, when bees are queenless, for any reason, for a few days just when there is lots of pollen, they gather lots of it. Place the combs of pollen in a strong colony close to the brood-nest and they will move it. In this way combs can be cleaned in ten or fifteen days."

Crops and Markets

1. What had an average heavy swarm of bees ought to produce, assuming ordinary conditions and management?

2. How do you develop a market?

MONTANA.

Answers.—1. It is impossible to give an accurate reply to the question, for crops of honey differ according to location, prolificness of colonies of bees, management, etc. In some parts the crop of honey is very small, sometimes nil. In other parts, where the climate and flora are advantageous, the crops are always large. In these parts we figure 50 pounds a good average crop, but we have had seasons with nothing, and seasons with an average of 237 pounds. If we are not mistaken, you are located in the irrigated region of Montana, where honey crops are good.

2. Honey markets are developed, as with all fancy goods, by seeking sales and giving good goods for the money. Honey is not a staple, but in a country that consumes over 80 pounds of sugar per head, the producers of honey ought to sell their product (about 2 pounds per head) readily and at paying prices.

Winter Feeding

I have 3 hives that have lots of bees, but not much honey for winter. Will they live with sugar syrup if I feed them on warm days? I have fed them a little already. I give them a pint at a time. NEBRASKA.

Answer.—Feeding bees on sugar syrup in winter is very precarious, for it often happens that several weeks pass before you can feed them. If I had colonies that were entirely short, I would put them in a dry cellar, in some quiet corner and would feed them on sugar candy, made by adding water to sugar and boiling slowly until the water is evaporated. Stir constantly so that it will not burn. To know when it is done, dip your finger first into

cold water, then into the syrup. If what adheres to the finger is brittle to the teeth, it is boiled enough. Pour into shallow pans, slightly greased, and when cold break into cakes. Lay the cakes right over the cluster of bees on top of the combs.

Candy will last longer than syrup, is just as good, and you can easily feed more. We have saved bees in this way, though at best it is not a very good thing to feed in winter. You should read some textbook and get posted.

Paint for Hives

Can you tell me anything about the use of creosote as a paint for hive bodies? That is, if the bees would have any objection to its smell, or if it is liable to flavor the honey when used inside the hive?

I was planning to make some hive bodies, during spare time this winter, from some very soft lumber. These bodies will not last very long unless preserved in some way.

If it won't do to use creosote oil, I had figured on getting some cheap gray oar paint and painting all the parts before nailing.

What do you think would be best?

You will probably tell me that it will not pay me to make hives like this, but as the lumber does not cost me anything except the work to haul it to and from the saw mill, and as I have lots of spare time in the winter, I think it will be cheap hives anyway.

MINNESOTA.

Answer.—I have never tried creosote about the beehives. It is my impression that, if you were to try to hive swarms in hives coated with this material, the bees would refuse to occupy the hives. Yet, we see them swarm into chimneys, where there is certainly a strong odor of creosote.

The suggestion you make of the creosote flavoring the honey is worth considering. I remember a family complaining of a can of honey we had sold them, having the odor of kerosene. We made an investigation and ascertained that they had just moved from one house to another, and the coal oil can and the pail of honey had been hauled side by side for the half mile of transportation. It does not take much to taint good honey with an undesirable smell.

On the whole, better use some cheap paint with plenty of oil, and let it dry thoroughly before putting bees into those hives.

Perforated Combs

I have many empty extracting combs which the bees perforated when cleaning out after extracting. These holes are about the size of clover seed. Will the bees repair these combs if given during a good honey flow? The combs are all new, having been used only this season. NEW YORK.

Answer.—I would be willing to wager that you exposed those combs outside, in order to have the bees take the honey out. We have never had combs perforated by the bees, when they were given peaceful possession of them over the hive body. Not only do they perforate them but they waste a great deal of the wax, by cutting it out to get at the honey more quickly.

It will not do much harm, as they will repair those combs when they are given to them in the spring. But it will be just that much additional labor. The newer the combs are, the more readily are they damaged by the bees when "robbing out" the honey.

Double Hives

Please explain why so many people have swarms of bees in two brood chambers or hive bodies. I tried that and the bees would not work in it. I placed an extra hive body filled with full foundation under the original brood chamber the last of May and later upon investigating I found they did not occupy it, so I just changed it *vice versa* and it was just the same, using their one body.

CONNECTICUT.

Answer.—If you have a family of 10, it will take a larger house than if you are only 4. So if your colony has a prolific queen and favorable circumstances, the queen may fill two bodies, or nearly, with brood. That is all the secret of the two bodies in some cases. You need to purchase a textbook and read it, so as to find just how much room a colony may occupy if it is in very good circumstances. It will pay you to be able to know when a colony needs another story. But you must not give the other story till they need it or are likely to need it soon.

Color of Drones

My bees are 3-banded Italians, but in some of them the drones are yellow under the abdomen, with one yellow stripe on the back, while the others have much lighter colored 3-banded working bees, and the drones are yellow under the abdomen and have 3 yellow stripes on the back. Now I was thinking of raising a few queens for my own use next summer and would like to know which would be your choice to raise them from, the ones where the drones have only one stripe or where the drones have 3 yellow stripes. IOWA.

Answer.—As long as your bees are 3-banded Italians, the greater or less color of the drones cuts very little figure. They are all pure Italians. Unless you care for color first, in which case you will breed from the yellowest I would advise you to breed from the queens whose hives have given you the largest crop. The test of quality, as long as we have purity and gentleness, is in honey-producing qualities. Breed from those that produce the most and you will have no cause to be sorry.

Drawing Combs

How much honey do you think it requires for bees to consume to produce wax enough to draw one Langstroth frame of medium brood foundation to the required depth for brood? My estimate figures $1\frac{1}{2}$ pounds, but you know exactly. TEXAS.

Answer.—No, I don't know exactly, for I do not believe there is any positive figure about it, the matter depending much upon the season, the warmth of the hive, the weight of the foundation, etc.

I believe, however, that your figure is quite safe and that the quantity of honey required to draw out one sheet of medium brood foundation would not exceed a pound, if the weather was warm enough to enable the bees to thin out and stretch the surplus of wax in the foundation. It would probably not require more than an ounce or two of beeswax. The base of the comb is the part that contains the largest amount of wax.

Bees and Fruit

Maybe you can settle an argument I had with a couple of friends. One of these friends has just bought a small farm, and has a fruit orchard. I asked him if he had any bees. He said he would not keep bees, because they sting the fruit and spoil it. The other friend agreed with him. He spent about ten years working in a nursery. He said he had spent day after day hanging paraffin sacks on grape vines to keep bees from spoiling the fruit. I have never spent a day on a farm, and have never kept bees. But I have always heard that if you have an orchard, your fruit does better if you have bees, because they help to carry the pollen from one bloom of tree to the other. Who is right? ILLINOIS.

Answer.—You are correct in saying that bees are necessary to fertilize the fruit blossoms. You will find that statement in any book on bees. The bees go to the flowers after pollen to feed their brood, and in gathering it, they drop a part of it on the stigma of the pistil. Covering apple blossoms before the buds are out, with gauze, and removing the gauze after the flowers are gone prevents fertilization. Some plants, like pistillate strawberries, absolutely need the pollen of other strawberries

carried to them. Many Kieffer pear trees fail to bear fruit because there are no other varieties of pears in the vicinity and the Kieffers are poor pollen producers. Melons, cucumbers, pumpkins, have the male organs on one blossom and the female on another and insects are indispensable to fertilize the fruit. I could quote dozens of similar instances.

You have a very good authority near you on bees and fruit, H. W. Funk, who has kept bees in a large orchard for years. If your friends won't believe me and all the works on fruit and on bees, let them ask Funk.

Your friend who spent day after day hanging paraffin sacks on grapes did not know that he was doing that against birds and wasps and hornets and not bees. Bees cannot puncture fruit. To make sure of it, put some ripe grapes inside of a hive of bees, crushing one or two berries, but leaving the others intact. You will soon find that the bees will clean out the damaged berries and will not hurt the others, because they cannot. You can test this for yourself.

As to bees stinging fruit, that is just silly. If they would sting the fruit, they would poison it. They never use their sting on anything but enemies.

Tell your friends to read up and get posted. There are too many people who are satisfied with looking at the sunrise and the sunset and decide by that that the sun turns around the earth. We are in a day of information. Let them read and not take things for granted.

Thanks for giving me a chance to take the part of the little bee. Too many people think the bee is guilty of a lot of crimes which she never commits.

ODDS AND ENDS

Rains in Texas

The State Department of Markets of Texas reports copious rains which are having the effect of rejuvenating the honey plants of the state so that prospects are now much better than they were a month ago. According to their report, bees seem to be in good shape and prospects, so far, much better than a year ago.

California Wants New Law

According to the Sacramento, California Bee, the Butte County Beekeepers' Association of that state has endorsed the suggestion of Mr. Fred C. Brosius, of the State Department of Agriculture that there be a centralized authority for bee disease control. Mr. Brosius expects to frame a law and draft changes in the present law so that the control can come from the State Department and work down through the county inspectors. As the law now stands, the county inspectors are responsible only to the supervisors of each county, making centralized control impossible.

Central Pennsylvania Beemen

The Central Pennsylvania Beekeepers' Association will hold their annual meeting in Williamsport, Saturday, February 3. First session at 2 p. m. and second session at 7:30. R. E. Merrill.

Good Business

At the Iowa convention, E. M. Cole, of Audubon, stated that a Cali-

fornia beekeeper of his acquaintance never sells his crop the same year it is produced and never fails to get at least double the price he is offered at the time his crop is taken from the hives. Honey is not a perishable product and there is no reason why the beekeeper should be panic stricken in case he fails to sell it within a month after it is off the hives. The beekeeper should set what he considers to be a fair price for his product and hold it until he gets it. The senior editor of this Journal has held white clover honey in barrels for several years when the price was low.

A New Colorado Bulletin

"Beekeeping in Colorado" is the title of a new Bulletin issued by the Colorado Agricultural College, Fort Collins, Colo. It is the work of Newton Boggs, who presents the usual beekeeping advice in a new and interesting way. The bulletin also contains facts about Colorado conditions, which make it of interest, not only to Colorado beekeepers, but to beekeepers in others of the western states as well.

It is also unique because, as far as we know, it is the first attempt yet made in a publication of the sort to give facts about environmental conditions influencing honey production. There is one paragraph concerning altitude and nectar secretion in Colorado. The discussion of foulbrood is also good.

A Business Organization

There has been recently organized a new association in Indiana to be known as the Indiana Honey Producers' League, with a membership fee of \$10 per year. It is the purpose of this association to undertake a line of work which the present organizations are not prepared to handle. Advertising of honey, stimulation of new markets and other buying and selling problems will be undertaken. Officers for the coming year are E. S. Miller, President; Jay Smith, Vice President; C. O. Yost, Secretary, and W. A. Hunter, O. A. Smith and Chas. Kennard Executive Committee.

It is the plan to affiliate with the American Honey Producers' League and they hope that other states will follow with similar business associations.

North Dakota Organized

I wish to announce the birth of the North Dakota State Beekeepers' Association, which occurred Monday, December 11. We could not have had a worse day for our meeting, since there was a howling blizzard outside all day long. A sufficient number of men turned out to hear Messrs. E. R. Root and E. W. Atkins, both of whom were here for the occasion. Seven counties in the state were represented at the meeting.

The officers of the Association are as follows: President, T. A. Williams, Cleveland; Vice President, Geo. Duis, Grand Forks; Secretary, R. L. Webster, Fargo; Treasurer, James Weiser, Fargo. Executive

Committee, Willis L. Crites, Amenia; Mark Andrews, Fargo; Dana Wright, Jamestown.

The President of the Association, Mr. Williams, has kept bees in Stutsman County since 1915. His average production this year was about 300 pounds per hive.

We are working on a foulbrood law which will be presented by the Association to the Legislature this winter. The newly-formed Association went on record as urging support for the beekeeping work at the college. I feel that there is certainly a great future for the beekeeping industry in North Dakota.

R. L. Webster.

Kansas Meeting

The Kansas State Beekeepers' Association will hold its annual meeting at Topeka, Kans., February 6 and 7, and then adjourn to meet with the Apiary Department of the Kansas State Agricultural College at Manhattan, on the 8th and 9th.

A practical and strong program is being prepared for the Topeka meeting. The meeting at Manhattan will be well worth anyone's time who is interested in apiculture.

O. F. Whitney, Sec'y.

Honey in Radiator

I have been using honey in my radiator with full satisfaction. I have left my car stand outside in zero weather and have the first time to find ice in the radiator. I use two parts honey to one part water and find the mixture satisfactory in every way.

R. E. Merrill,
Muncy, Pa.

Burrill in New Work

Prof. A. C. Burrill, Extension Entomologist of the University of Missouri, is the new curator of the Missouri Resources Museum at Jefferson City. We understand that this position is temporary and that Professor Burrill will return to his work at the University after he has completed the installation of the exhibits at Jefferson City.

Bees Busier Than Ever in Germany

Sugar scarcity increases demand for honey, and honey-makers are fewer than before the war.

Scarcity of sugar in Germany has greatly increased the demand for honey, says Consul General E. T. Dumont, in a report to the Department of Commerce. In spite of this the domestic supply has decreased. The number of beehives in Prussia and in the Prussian Provinces has dropped 15.34 per cent from 1912 to 1921. Only in the province of Schleswig-Holstein has the number slightly increased, all other parts of the country showing a heavy falling off. The chief provinces for the production of honey are still East Prussia, Brandenburg, Lower Silesia, Pomerania and Hanover. In Brandenburg and Lower Silesia hives with the removable comb are preferred, in Hanover and East Prussia stationary comb; and in Pomerania both kinds are used.

The best quality of Hessen-Nassau strained honey, from the vicinity of Cassel, retails at Frankfort at 300 marks per pound, or about 6½ cents. Honey in the comb of the same quality retails at 400 marks per pound. This is a light-colored honey made chiefly from early flowers and tree blossoms. Another brand which is also greatly prized for its flavor is the darker colored "Heide," or heath honey. There is no difference in price.

A Novel Idea

The Commercial Club at Minden, Neb., acting on the suggestion of a local beekeeper, Mr. H. W. Binderup, arranged a special Bee and Honey day for Friday, January 5. Three lectures were arranged with Prof. F. B. Paddock, of Ames, Iowa, as the speaker. In the afternoon the lecture was on "Honey and Its Uses," given to the school children. In the evening the public was invited to the opera house to hear a general illustrated lecture on bees, etc. On Saturday afternoon a session was provided for farmers and others interested in practical beekeeping.

We feel that such a program is well worth while. Not only does such a program interest the general public in honey and its use in the home, but those who keep bees are encouraged to adopt the best methods of production and marketing. Other localities may well follow the suggestion of Mr. Binderup and the Minden Commercial Club.

The Apis Club of Wisconsin

An interesting and worthy development in apicultural organization is that being attempted by the University of Wisconsin in the formation of the Apis Club of Wisconsin. The main purpose of the club is to create a greater and more definite interest among students in beekeeping as a profession, and it is the hope of the organizers that this movement will spread to all the colleges and schools where apiculture is of importance. The Apis Club of Wisconsin was organized in January, 1921, and it is proposed to extend this organization to other schools as fast as possible, with the idea of forming an Apis Club of America. A second unit has been established at the Pennsylvania State College and the organizers are in communication with other universities and it seems probable that further units will soon be established.

This is a good movement and should receive support. The organizers are further interested in developing a series of state and national experimental associations through members who belong to the Apis Club. Those members who go into practical beekeeping will be asked to keep records on such factors as weather, blooming of plants, nectar secretion and others which will give worth while information on beekeeping conditions.

Those interested should correspond with Prof. H. F. Wilson, of the University of Wisconsin, Madison, Wis.

Danger From Feeding Candy

W. P. Southworth reports that in the vicinity of Sioux City an extensive beekeeper secured a large quantity of hard candy which had been damaged by water or smoke. He dissolved this candy in hot water and fed it to his bees to stimulate early breeding last spring. There was glucose in the candy and as a result his bees died in large numbers. There are only two things which are safe for bee feed—natural honey and pure sugar.

New England Activities

Largely through the efforts of the New Hampshire Beekeepers' Association, the College will offer seven credits in beekeeping to its students for the first time. There will be a 2-credit course in the spring of the year, which will really be a beginners' course, and another 2-credit course in the fall on commercial beekeeping, in which the late summer and fall practice will be exercised, and then another 3-credit course will be offered to the 2-year students who expect to go back on the farm. Mr. J. R. Hepler, of the Department of Horticulture, will teach these courses.

The Association is also trying to pass an inspection law for New Hampshire. At present New Hampshire is not allowed to send bees to certain states. In fact, I think every New England State excepting New Hampshire has an inspection law which shuts out the uninspected bees. The Association has the backing of the Farm Bureau in this proposed legislation.

Prospects in Arizona

The past season's crop was light. I got less than 2 carloads from 19 apiaries; some beekeepers did not extract any. The mesquite was a failure. So much of the alfalfa had been plowed up during the cotton bloom that the bees were short of bloom, but large acreage has been seeded to young alfalfa, greatly improving the prospects. We also had a period of about 8 months without rain, but lately several light showers have started the desert to look green. Many train loads of sheep have been shipped to our valley and to range on the adjoining desert. The stockman and the beekeepers are rejoicing; a few more showers will make the desert a sea of grass and flowers, which means an early and heavy swarming season. The desert bloom yields in both pollen and honey and gives the colonies a large force for the mesquite and alfalfa flow. The cotton is a slow and sure yielder and comes late, but is a great help to prepare winter stores and young bees. Probably one-half of the honey crop has been shipped at prices a little in advance of last year; but little frost so far. No fire was in our church yesterday (Dec. 17). Plenty of water for irrigation. Alfalfa 8 inches high; grain doing well.

B. A. Hadsell,
Buckeye, Ariz.

An Interesting Sales Method

Mr. Stanley A. Ranney, of Council Bluffs, Iowa, has an interesting method of advertising and selling his honey. He sets an attractive stand or booth in a busy part of the city, with appropriate signs, and an observation colony of live bees to attract the attention of those passing by. He is able to dispose of considerable honey by this method.

Paste for Tin

There has been considerable said of late concerning paste that will hold a label on glass or tin, and on page 559 of your December number of the American Bee Journal you bring up the matter of adding silicate of soda. For years we have been successful in using silicate of soda as a paste on all kinds of tinware, glass, etc., and with unqualified suc-

cess. Don't know how we found it out, but in putting down eggs in the usual manner we use silicate of soda or water glass, diluting 1 to 10, and when the eggs are used, at the bottom of the solution there will be a sediment. This sediment is the paste we have used and virtually costs nothing, as it has fulfilled its mission in keeping eggs.

By the way, accidentally, we found one crock of eggs left for two years, and upon breaking, found them perfectly good and sound.

E. J. Ladd.

PACKAGE BEES FOR 1923

THREE-BAND ITALIANS ONLY. BRED FOR BUSINESS

A 2-pound package of the Yancey Hustlers, with a select untested queen, for \$5.00; 25 or more, \$4.75 each. Attractive prices on large lots. One-fifth cash books your order. Safe arrival and satisfaction guaranteed on every package and queen shipped. Orders are now coming in for spring delivery. Better send in yours and make sure of shipping date. We do not accept more orders than we can fill promptly.

CANEY VALLEY APIARIES, Bay City, Texas

YANCEY BROS., OWNERS

BEEKEEPERS

WE MANUFACTURE DOVETAILED HIVES, HOFFMAN FRAMES, SECTIONS AND SHIPPING CASES

Our hives are made of best grade White Pine, cut accurate and smooth to standard measure. Sections are made of Basswood polished on both sides. There are no better made.

We carry a complete line of everything used in the apiary. Our shipping facilities are as good as can be found anywhere. We want your business. We guarantee prompt and satisfactory service. Price list free.

MARSHFIELD MANUFACTURING COMPANY, Marshfield, Wis.

GOLDEN ITALIAN QUEENS

	Nov. 1 to July 1			July 1 to Nov. 1		
	1	6	12	1	6	12
Untested.....	\$2.00	\$ 9.00	\$17.00	\$1.50	\$ 8.00	\$14.50
Select Untested.....	2.25	10.50	18.00	2.00	9.50	16.00
Tested.....	3.00	16.50	30.00	2.50	12.00	22.00
Select Tested.....	3.50	19.50	36.00	3.00	16.50	30.00

BREEDERS \$12.50 TO \$25.00

Queens for export will be carefully packed in long distance cages, but safe delivery is not guaranteed

NO NUCLEI, FULL COLONIES OR POUND PACKAGES

BEN G. DAVIS, Spring Hill, Tenn.

Nuclei Our Specialty—Package Bees

Three-banded Italian Queens

Our BEES and our EXPERIENCE will give you prompt and satisfactory service.

One 2-frame nuclei, no queen, \$3.75; 25 or more, \$3.50; 50 or more, \$3.25; 100 or more, \$3.00.

One 3-frame nuclei, no queen, \$5.00; 25 or more, \$4.75; 50 or more, \$4.50; 100 or more, \$4.25.

QUEENS: One untested queen, \$1.50; 12, \$15; 50, \$60; 100, \$100.

Two and three-pound packages of bees at the same price of two- and three-frame nuclei, respectively. Our early order discounts from above prices will interest you. Write and get them before placing your order.

Cotton Belt Apiaries, Roxton, Texas

Looks Like it Pays

Several have asked or answered the question "Does Beekeeping Pay?" in recent issues of this Journal. W. H. Lattner, of Olathe, Kansas, thinks that it does. He has sold \$3,500 worth of honey, honey vinegar and bees from his apiary in Olathe the past year. He sells all his honey direct to the consumer at 20 cents per pound. He insists that it is possible to sell at a good price even though others sell at a lower figure. He argues that it is better to ask a good price and use part of the money in advertising rather than to sell cheap in an effort to make a quick sale.

More Poison in Cotton Spray

A report from South Carolina is to the effect that the spraying for boll weevil has injured the bee industry of this state. Practically no honey was secured by beekeepers in sections where such spraying was done, and in many instances the bees were destroyed.

Eastern Beekeeper Dies

We have learned through his widow of the death of Mr. John Bennion, of Flushing, N. Y.

Mrs. Bennion feels that she is unable to care for the bees herself and desires to dispose of them. Anyone interested should write her.

The bees are in double-walled hives and in good shape.

WE WANT MEN

to buy our Guaranteed Nursery Stock. To the Gardener: Write us your needs on Landscape Work. Write for plants. To the Buyers: Send for free colored circular. **The Coe, Converse & Edwards Co., Wisconsin's Largest Nursery, Fort Atkinson Wis.**

Our Specialty

Working your wax into foundation for CASH or WAX in payment.

Ship your wax now for 1923 season.

Write us for list of supplies and get our prices.

GUS DITTMER CO.

Augusta, Wis.

The Stapleton Apiaries

Are located in Southern Georgia, near the Florida line, and we are in position to make early shipments of bees and queens. Queen rearing yard is in charge of Mr. A. S. Blanks, who has had eight years' experience in Georgia, Florida and Texas. Write for prices.

N. L. STAPLETON

Colquitt, Georgia.

Dixie Beekeeper

The 45th edition of this 32-page paper is now out and a sample copy is ready for you, for the asking. All about beekeeping in Dixie.

FLORIDA BEES AND QUEENS

This hardy and prolific stock of 3-band Italian bees has been reproducing itself for more than thirty years in the sand hills of central Florida. Three-frame nuclei with queen, \$6.00. Tested queens, \$1.50 each. Untested queens, \$1.00.

WILDER'S CYPRESS HIVES

Will give you satisfaction in point of service and prices to suit you.

Write for price list and catalog.

J. J. WILDER

Waycross, Ga.

Quality and Service From

FLORIDA BRED GENUINE THREE BAND LEATHER ITALIANS

Shipped on good combs of natural stores insures arrival in fresh condition, and quickly build strong, hustling colonies. Constant improvement in select breeding from bees possessed with rare qualities of vigor, gentleness and beauty enables us to offer a great honey gathering strain. Safe arrival and satisfaction guaranteed. No disease. Certificate of inspection with each shipment. 20 per cent cash books order, balance before shipment.

Prices include choice queen.

	1 to 24	25 to 48	50 to 100
2-lb. ---	\$4.75	\$4.50	\$4.25
3-lb. ---	5.75	5.50	5.25
3-fr nuclei	6.00	5.75	5.50

M. L. NISBET
P. O. Bainbridge, Ga.

PACKAGE BEES, QUEENS AND NUCLEI

DOLLAR A POUND

Queens accompanying, \$1 additional.

Nuclei, 2-frame ----- \$3.00

Nuclei, 3-frame ----- \$4.00

Either Standard or Jumbo Langstroth

Queens, untested, \$1; tested, \$1.50.

Breeders, \$5.00, \$10.00, \$15.00.

These low prices are made in consideration that orders are booked early, so that we may prepare for them in the winter. Send for circular.

Loveitt Honey Co.

602 N. 9th Ave., Phoenix, Ariz.

BARNES' FOOT POWER MACHINERY

Read what J. E. Parent of Chariton, N. Y., says:

"We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work."



W. F. & JOHN BARNES CO.,
995 Ruby St., Rockford, Ill.

TENNESSEE QUEENS

Book your orders early for pure Italian queens. My three-band Italian bees will please you. My direct crossing makes them hardy, prolific and vigorous. No disease. Get service while you can. Write for price and circular.

A. REYNOLDS,
Crestview, Tenn.

PORTER



**BEE
ESCAPE
SAVES
HONEY
TIME
MONEY**

For Sale by all dealers

If no dealer, write factory

R. & E. C. PORTER, MFRS.
Lewistown, Ill., U. S. A.

(Please mention Am. Bee Journal when writing)

Honey in the Local Newspapers

A set of 25 articles on honey, specially prepared for distribution by the beekeeper to local papers to stimulate the demand for honey. These articles deal with interesting phases of beekeeping which will interest the ordinary reader and help make a buyer of him.

We offer the whole set of 25 articles at a postpaid price of only 50 cents, or in lots of ten or more sets at 35 cents each, postpaid.

A real opportunity to have your local people get interested in honey and its production and use.

Order a set today.

AMERICAN BEE JOURNAL

Hamilton, Ill.

ROOT QUALITY

BEE SUPPLIES

FULL STOCKS PROMPT SERVICE

A. I. ROOT CO., of N. O.
2042 Magazine Ave., New Orleans La.

Also headquarters for Elton Warner's three-banded Italian Queens, Nuclei and Combless Packages.

One Elton Warner Quality untested queen, one frame emerging brood with adhering bees, and one pound of young vigorous bees, price \$5 f. o. b. New Orleans. Extra bees, \$1 per lb.

3-frame nucleus, with Elton Warner Quality untested Queen, price \$5.50 f. o. b. New Orleans.

Combless packages, \$1 for package, plus \$1 per pound for bees, and price of queen, if queen is wanted.

Young, vigorous TESTED Elton Warner Quality Queens; wonderful honey-gathering strain for EARLY spring shipment. \$1.60 each, postpaid.

Untested Elton Warner Quality Queens, After April 10, \$1.15 each, postpaid.

Everything guaranteed, including delivery date. No disease; 20 per cent books order; 10 per cent discount on orders of over \$20; 15 per cent discount on orders of \$60 or over.

Almacén de exportación para México y Centro América. Correspondencia en castellano.

BEES — ITALIAN BEES — BEES

Full colonies with Italian queen at \$15.00 3 for \$30.00.

3-frame nucleus with Italian queen at \$6.00.

3-lb. package with Italian queen at \$5.50, 5 at \$5.00.

No disease. Safe arrival and satisfaction guaranteed.

Van's Honey Farms,
Van Wyngarden Bros., Props., Hebron, Ind

BEAR'S WONDERFUL MOUNTAIN BRED ITALIAN BEES

Will give you a return on the money that you invest that can be excelled by no others. I send you one Hoffman frame, with honey and emerging brood, one pound of bees, one splendid young golden or three-band or leather-colored queen, mated and laying en route to you, and one pound of bees, for five dollars, or two frames of brood and the above for six dollars. These bees are raised high up in the Allegheny Mountains, where conditions make for long-range honey gathering. No man in the United States can ship better bees than these are. Send me a trial order, place your order now for May delivery. Ten to twenty per cent books your order. Carniolans, I can save many of you one to two thousand miles of the long haul over orders from the south and west. Safe delivery guaranteed. (These three words mean what they express). Health certificate. Send the order now.

HIRAM H. BEAR, Hinton, West Virginia

QUEENS
Three-band Italians

PACKAGE BEES

QUEENS
Silver Gray Carniolans

Western headquarters for PACKAGE BEES and RELIABLE QUEENS. Order now for spring delivery. Shipping season for PACKAGE BEES starts April 1, closes July 1; Queens April 1 to October 1. A small deposit reserves your shipping date.

Young bees, every one from a clean colony, with no honey used in shipping cages, also County Inspector's Certificate of bill of health with each shipment I guarantee. Write for circular and prices, stating quantity desired and date of delivery.

J. E. WING, SAN JOSE, CAL.

155 SCHIELE AVE.

Queens Package Bees for the Season of 1923

Mr. Beekeeper: If you want the best quality that is possible to produce, at the lowest price possible to produce, here is the place to buy your queens and bees. I positively guarantee that NO BETTER BEES CAN BE BOUGHT, NO MATTER WHERE YOU BUY THEM. When you order a tested queen or a selected untested queen from me I don't go out in the yard and cage the first thing I come to, like 50 per cent of the queen breeders do. I send out what I advertise; every queen or package must give satisfaction. Now is the time to place your order for spring delivery. Note my prices; if you can buy better bees for less money I would like to hear from you. One-fourth down with order, balance before shipping date.

PRICES—QUEENS

	1	6	12	100		1	6	12	100
Untested	\$.95	\$ 5.50	\$10.00	\$70.00	Select untested	1.10	6.50	12.00	80.00
					Tested	2.50	12.50	24.00	175.00

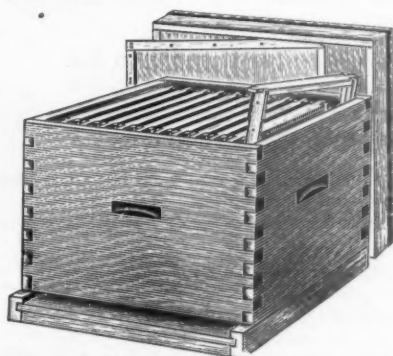
POUND PACKAGES WITH SELECTED UNTESTED QUEENS

1-pound packages, 1 to 12, \$3 each; 12 to 50, \$3.90 each.
2-pound packages, 1 to 12, \$4.50 each; 12 to 50, \$4.40 each. 3-pound packages, 1 to 12, \$5.50 each; 12 to 50, \$5.40 each.
Shipment will be made on date specified. Prompt service and satisfied customers a specialty.

THE FARMER APIARIES, Ramer, Alabama

IS THE LARGE HIVE A DANGEROUS FAD ?

Less initial investment. Less labor per maximum yield. More adequate space in one body for brood rearing and winter stores than other hives.



Quinby depth brood frames, 11, centerspaced 1½ in. Built only as "Beeware" is. Standard bodies used for supers. Suitable for comb or extracted honey production

Every well posted beekeeper knows the name Dadant has come to stand for dependability among beekeepers everywhere. When the Dadants evolved from old and proven principals of beekeeping, the—

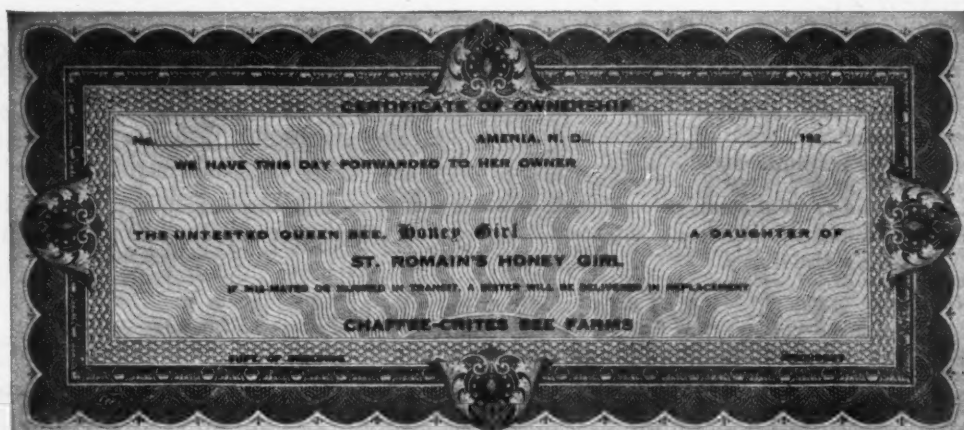
— MODIFIED DADANT HIVE —

Lewis welcomed the opportunity to build it. The name Lewis has stood for dependability in "Beeware" for 49 years. Knowing the future of the Lewis-Dadant organization depends upon your satisfaction with our products, we do not hesitate to commend the Modified Dadant as a

A SAFE HIVE

Let us tell you of beekeepers owning as many as 600 colonies, all in this hive. Ask for free booklet. Better yet, send us \$5.00 today for one of these hives, K. D., sent within the fourth postal zone, postpaid, from any address of the G. B. Lewis company named below.

DADANT & SONS, Hamilton, Illinois
G. B. LEWIS COMPANY, Watertown, Wis. or
Albany, N. Y.; Lynchburg, Va.; Memphis, Tenn.; Wichita, Kansas.



QUALITY
QUEENS
at
REASONABLE
PRICES

This certificate tells the owner of a Honey Girl Queen that he may expect increased production because QUEENS OF HER BLOOD have already made record productions. It will pay you to introduce a few Honey Girl Queens this summer and prove to yourself that they are a real economy. Get the facts! Write for our prices!

WRITE FOR
PRICES AND
FREE BROCHURE
G. 37

CHAFFEE-CRITES BEE FARMS

AMENIA, NORTH DAKOTA

HONEY

Beekeepers who have sold their own crop and have a steady trade for Honey should buy Honey to fill this demand. It helps to keep their own customers from going elsewhere and also tends to keep Honey prices stabilized.

In 60-lb. Tins,

White orange ----- 14c lb. White sage ----- 12c lb.
Extra L. A. sage ----- 10 1/2 c lb.

GLASS AND TIN HONEY CONTAINERS

2 1/2-lb. cans ----- crates of 100, \$4.50
5-lb. pails (with handles), ----- crates of 100, \$7.00
10-lb. pails (with handles) ----- crates of 50, \$5.25
60-lb. tins, 2 per case, new, \$1.20 case; used, 25c.

White Flint Glass, with Gold Lacquered Wax Lined Caps

8-oz. honey capacity ----- \$1.50 per carton of 3 doz.
16-oz. honey capacity ----- \$1.20 per carton of 2 doz.
Quart, 3-lb., honey capacity ----- .90 per carton of 1 doz.

HOFFMAN & HAUCK, Inc., Woodhaven, New York

QUEENS

NORDAN'S THREE-BANDED ITALIAN QUEENS (Three-banded only).

Have won World-wide Fame.

They are guaranteed to be absolutely immune to Bee Paralysis. I am booking orders now for spring delivery.

Prices on Queens and Packages:

Select untested queens, 1 to 50 ----- \$1.00 Select tested queens, 1 to 50 ----- \$1.50

Packages:

One-pound packages, with select untested queen, 1 to 50 ----- \$2.50

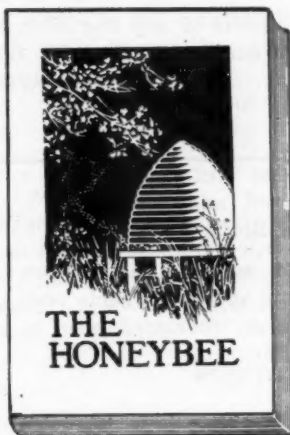
Two-pound packages, with select untested Queen, 1 to 50 ----- \$4.00

Can make shipments when you want them, either queens or packages. I will appreciate your orders, large or small.

References: Alabama Bank and Trust Co., Montgomery, Ala.

M. S. NORDAN, MATHEWS, ALA.

UP-TO-THE MINUTE BEE BOOKS



Our series of nine beebooks covers all important subjects in the beekeeping field. Real helps in honey production. Classics and special books.

THE HONEYBEE, by Langstroth and Dadant, brought up to date in 1922 by C. P. Dadant, is a classic and a thorough text book for all. Finely illustrated and contains, besides all the fundamentals of that master, L. L. Langstroth, practical up-to-date material by the Dadants. Should be in every beekeeping library. Cloth bound, 450 pages. Price \$2.50. Spanish edition \$2.50.

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BEEKEEPING IN THE SOUTH, by Kenneth Hawkins. Written by a former government extension man who worked several years in all parts of the South. Excellent both for the southern beekeeper and for the northern man who anticipates southern yards. Price \$1.25.

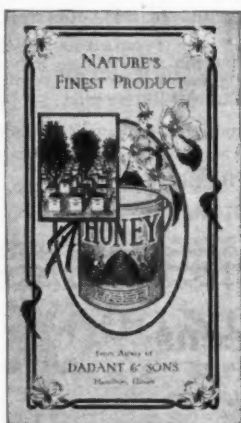
OUTAPIARIES, by M. G. Dadant. Gives a practical system of management for outyards, founded on experience. The proper location, placing of yards, rentals, etc. Price \$1.00.

SCIENTIFIC QUEEN REARING, by G. M. Doolittle. A thorough description of the author's method of artificial grafting of cells and his mode of queen rearing. Paper cover 50 cents; cloth \$1.00.

HONEY LEAFLETS

The beautiful five-color leaflet illustrated at the left has four pages, and gives briefly the methods of raising honey and its value, together with several honey candy recipes. Designed for distribution generally to prospective customers. Price of 500, with your own name and address at the bottom, postpaid, only \$7.50; 1,000, \$11.50.

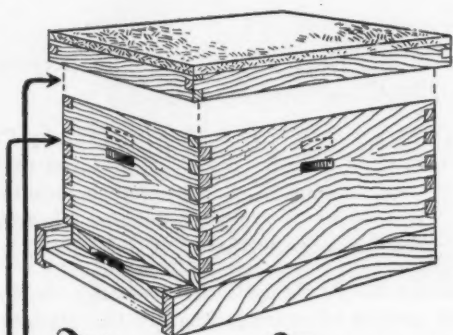
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AMERICAN BEE JOURNAL

HAMILTON, ILLINOIS

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*Want more Room?
The Jumbo is $11\frac{13}{16}$ " Deep
The Standard ten
frame is $9\frac{5}{16}$ " Deep.
Same covers and bottoms
fit both—Approximately
27% more capacity in Jumbo*

A simple statement of fact for producers wishing larger equipment:

The Jumbo hive has all the merits of any Big Hive, is used with standard equipment, and is the cheapest Big Equipment on the market today. Write for our special introductory offer.

SERVICE COUPON—Tear off and mail.
The A. I. Root Co., Council Bluffs, Iowa:

Gentlemen: Please send me full information about the Jumbo. "More room at least possible cost sounds good to me." And I am interested, also, in your special introductory offer.

Name

Address

THE A. I. ROOT CO.
Council Bluffs, Iowa.

Annual Sweet Clover Seed for Sale at Low Prices

PLANT IT FOR THE BEES.

We have only a limited amount of this seed.

Fifteen years ago M. C. Berry discovered this wonderful plant growing on the "Old Gilmer Plantation," near Tyson, Ala. Since that time we have watched with interest its great spread and growth throughout Alabama. As a plow-under green manure crop it has no equal, and for honey we find it wonderful. In gathering this seed we had a lot that through a misunderstanding were mixed with biennial; therefore, our loss is your gain, as we are selling hulled and scarified seed at the following unheard of low prices:

Prices as follows, transportation prepaid:
5 to 10 pounds, 25c a pound; 25 up to 50 pounds, 20c a pound; 50 to 100 pounds, $17\frac{1}{2}$ c a pound; 100 pounds and up, 15c a pound.

Seeds are guaranteed to be pure sweet clover running from 50 to 90 per cent pure annual and the balance biennial. Germination we guarantee to please.

M. C. BERRY & CO., Box 697, Montgomery, Ala., U. S. A.



Needed by Every Beekeeper Good Queens In Every Queen and Package

There is a guarantee of satisfaction that you have a right to expect
BUY FOREHAND'S 3-BANDS, YOUNG AND HUSKY

The three vital needs of successful honey production are, GOOD QUEENS, GOOD MANAGEMENT and GOOD LOCATION. You furnish one, Nature one and I furnish the other. But you must be the judge of all. You don't want a location in a desert, neither do you want poor queens. You have the same right to choose and reject queens as you have to choose your location. My guarantee allows you this.

Your dollar's worth or your dollar back. Order now and get your bees and queens when you want them. Ten per cent is all that is required with order.

	1-4	5-11	12-24	1	25 and up
Untested	\$1.25	\$1.20	\$1.15	One pound pure Italian bees with young queen.....	\$3.00
Select untested	1.50	1.45	1.40	Two pounds pure Italian bees with young queen.....	5.00
Tested	2.50	2.45	2.40	Three pounds pure Italian bees with young queen.....	6.50
Select tested	4.00	3.95	3.50		6.25

All bees and queens guaranteed to reach you in good condition in the United States and Canada.

N. FOREHAND, RAMER, ALABAMA



Crop and Market Report

Compiled by M. G. Dadant.

For our February page we asked only questions pertaining to the sale of the crop of honey. They were as follows:

1. How is the crop moving?
2. At what price is comb and extracted selling, wholesale and retail?
3. What proportion of the crop is disposed of?
4. How is the jobbing demand?

CROP MOVEMENT

Practically all reporters are unanimous in stating that there is an exceedingly slow movement of the crop since the holiday period. There seems to be a slack market demand, probably much more so than is usual at this period of the year.

PRICES ASKED

In general, prices as asked by the price-educated beekeeper rank about the same throughout the country. But there is yet considerable criticism of the price cutter, the producer who is so afraid that his neighbor will sell honey and force him to hold his own crop.

Many criticisms are directed at the roadside seller and the house to house direct-to-consumer salesman. Not because of the honey he is selling, but because this selling is being done in many instances at a cut rate which will not permit of competition by the honey which is seeking the market through the regular channels of trade.

A large number of these price cutters forget that if they wish to eliminate the middleman it will be necessary to replace him with some agency equally as efficient. This cannot be done by individual sales at cut prices. In fact, such sales have the opposite effect from that desired, in fact they discourage the regular channels from handling honey at all, and force a slackening of demand which is not replaced by the small amount of direct-to-consumer selling done.

In general, a price, retail, of 25 to 30 cents for comb and \$1.15 and \$2.00 for 5-lb. and 10-lb. extracted, respectively, is being asked. These prices are not any too high, when we consider that the jobbing price in carlots on comb runs from \$3.00 to \$4.00 f. o. b. shipping point, and at least 7 to 8 cents for white extracted.

CROP DISPOSED OF

Reports as to crop sales by producers are encouraging. But a few report as little as a half disposed of and a bulk of the reports are to the effect that from 75 to 90 per cent of the crop is in the hands of wholesaler or consumer. The entire South is well cleaned up on honey and is optimistic. Those sections reporting the most on hand are the larger producers of the north central states and the large extracted honey producers of the intermountain territory. Practically all comb honey is out of the hands of producers in all sections and the Government report of the Bureau of Markets would indicate that the middlemen are not overloaded.

Eastern Colorado seems well sold out, while the western slope is in need of a selling organization which will handle its crop intelligently.

Montana, last year at this time, had most of its comb honey on hand, whereas this year it is practically all sold at fair prices.

THE JOBBING DEMAND

The jobbing demand for honey is nil. Jobbers seem to be trying to clean up their old stocks before ordering fresh supplies. It hardly seems possible, however, that this apathy can continue and necessitate the holding of much honey by producers into the 1923 honey season. On the other hand, it may be possible that the amount in jobbers' hands (extracted honey) next fall may influence the jobbing demand at that time.

As a counteraction to this, imports of honey are now not equalling the exports, as much of the West Indian is seeking its way to the European markets at a better price than could be obtained after adding the duty here. Besides this, the price of sugar is very favorable to the use of honey in allied trades.

We see no reason for marked pessimism on the part of the beekeeper over the condition of the honey market, or the amount of honey likely to carry over till next season. But there is no doubt that it would not take a great reaction to place honey prices in danger of a distinct decline. This condition will likely continue until some effective means of marketing the crop is evolved. So far, the beekeepers have only in rare instances shown a real desire to aid the marketing problem by backing it financially.

The success of the two or three co-operative organizations should, however, be convincing that success lies along these lines.

4000 NUCLEI OR PACKAGE BEES FOR 1923

SUPERIOR ITALIAN QUEENS
POUND PACKAGES

WRITE FOR CIRCULAR
FULL COLONIES, NUCLEI,

CYPRESS BEE SUPPLIES

Hive-bodies, Covers, Bottoms, Supers, Frames. We can furnish you the best of the above at a fair price.
Let us quote you.

One-pound package, with queen, 1 to 20, \$3.25 each; 25 or more, \$3.00 each.
Two-pound packages, with queen, 1 to 20, \$5.00 each; 25 or more, \$4.50 each.
Three-frame nuclei, with queen, 1 to 20, \$5.50 each; 25 or more, \$5.00 each.

THE STOVER APARIES, MAYHEW, MISS.

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Beautiful Art Pictures of Ideal Chickens Reproduced in Four Colors

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Poultry Tribune The Big Leading Chicken Paper

Each picture is a pair of Ideal Standard fowls, beautifully reproduced in natural colors, on fine heavy enameled stock, 8 x 11 ins., suitable for framing.

Eight Popular Breeds

Paintings already completed are of Anconas, Barred Rocks, Buff Orpingtons, White Wyandottes; new paintings now in course of preparation are of Brown Leghorns, White Leghorns, Black Giants, Silver Wyandottes. These paintings are the most beautiful, most up-to-date, and most modern ever seen.

Paintings Made From Life

Poultry Tribune offers a valuable and most attractive contribution to the poultry literature of the day in the shape of this series of full page Art Engravings from paintings from life by Louis Stahmer, the nationally known breeder, judge and artist. Mr. Stahmer has made these wonderful pictures from the actual birds themselves, using as his models First Prize Winners at New York, Boston, and Chicago. They conform to the new 1923 Standard of Perfection.

Nothing Else Like Them

Words cannot describe the amazing life-like beauty of these wonderful pictures. The birds are in the pink of condition and perfection of feathering. The beautiful background, by contrast, adds to the beauty of both outline and color. You will gasp with admiration at this beautiful work of art.

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The Three Best and Most Authoritative
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Tells how to feed from shell to show room or market. For eggs, growth, meat, feathers, long molt, etc. Tells how to balance rations. Contains Feeding Formulas of leading experiment stations and foremost breeders. 14 pages, illustrated. Price 75c postpaid.



Built and Used by Poultrymen
Contains 67 building plans that save you money; plans and illustrations showing how to easily build complete modern breeding, colony, or brooder houses, pens, trap nests, brood coops, fencos, runs, arenas and hot air brooders, feed houses, etc. 120 pages, illustrated. Price 75c postpaid.



Secrets of Crate Feeding
By F. C. Harg who had charge of 14 Crate Feeding Stations where 30,000 chickens were fattened for market yearly and sold at a big premium. Tells everything about producing high quality meat; secrets of big pickers and feeders. Tells how to fatten quickly at cost of three to four cents a pound; 120 pages, illustrated. Price 75c postpaid.

Orders for any single book above, alone, filled at regular price.
Special 30 Day Offer! Any one of the above books FREE with 1 year subscription to Poultry Tribune at \$1.00; 2 yrs. \$1.50; 3 yrs. \$2.00.

Poultry Tribune, Box 212, Mount Morris, Ill.

These Pictures Can be Secured Only From Poultry Tribune

No other Poultry Journal in the United States has them. They are given free with the Poultry Tribune, one in each issue, making it the most valuable and most desired poultry literature published. Don't miss a single issue. Send today! Your first copy will come by return mail.

Poultry Tribune

tells you everything you want to know about raising poultry. It tells you how to make big money with them—helps you to succeed; tells how to mate, breed, feed, hatch, rear, house, get big egg yield, buy, sell, etc. Free Question and Answer Department, answers any problem you may have. Big monthly features by practical experts. Complete show and market reports. 24th year. Monthly, 80 to 120 pages. Beautifully illustrated. Art covers.

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3 Months 15c. 20 Months, in U. S. A. \$1.00; Canada, Cuba, Mexico, \$1.50; Foreign \$2.00.
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Box , Mount Morris, Illinois

GENTLEMEN: Please send me Poultry Tribune months together with the Free Pictures. Enter my subscription at once.

Please send me Poultry Tribune years, together with the Free Pictures, beginning at once, and send me Free Book checked below:

..... Secrets of Crate Feeding
..... What and How to Feed Poultry
..... Built and Used by Poultrymen

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Postoffice.....

State.....

Montreal District Beekeepers' Association

"The Jumbo Hive; Its Advantages and Disadvantages," was the subject discussed at a meeting of the Montreal District Beekeepers' Association held at the Mechanics Institute, Montreal, on December 15. Between 25 and 30 were in attendance.

Mr. A. W. Maitland read a very interesting paper fully covering the subject from different angles and answered many questions. The members were much interested in hearing Dr. Maitland's comparisons of the large and small hives, and his reasons for favoring the large, the capacity of his being twelve Jumbo frames.

The association is planning to hold meetings every month throughout the winter and early spring at 8 p. m. in the Mechanics Institute.

R. B. Ross, Jr.
317 Metcalfe Ave, Westmount, Que.

Riverside County Tries Unique Plan

The Riverside County, California, Beekeepers' Association are trying the coming year a new plan of marketing honey. Their plan is to have a general fund subscribed to by members to be loaned to other members on their crop. The idea is to prevent this honey from going on the market at a low price when any member is of necessity compelled to part with it. The plan of the members is to advance the money on this honey so as to hold it and obtain a uniform price.

In some instances it is suggested by the directors that the honey may be bought outright of such parties as are not members or who for some reason or other desire to sell outright at once.

This is a new departure and the working of the plan will be looked forward to with interest.

Wilder Suggests More Beekeeping

According to a clipping from the Atlanta Journal, Mr. J. J. Wilder goes on record recommending the establishment of apiaries on the margin of the big Okefenokee swamp. He states that 90 per cent of the plants in the great swamp are leading honey plants.

NUCLEI — 1923 April and May Delivery

We are prepared to book orders for April and May delivery of two and three-frame nuclei with tested or untested queens. Our capacity for 1923 will be 1,000 nuclei.

Our Manager in charge of our apiaries is C. E. Bartholomew, formerly Professor of Apiculture at the Iowa State College and later Specialist in Bee Culture with the U. S. Department of Agriculture.

Purchasers of our nuclei may be assured of quality stock and the best of attention in preparation for shipment under his directions. Our apiaries are located on the Florida Keys, five miles from the mainland. We own the islands where our breeding apiaries are located and nothing but new bee supplies are permitted to enter our apiaries or to be landed on these islands.

Our apiaries are located in disease-free territory and we intend to continue to keep it so. To establish our stock we purchased hundreds of queens from some of the best breeders in America and have selected from the best of these and their daughters for our breeding stock.

PRICES:

Two-frame nuclei\$4.25
Three-frame nuclei 5.25

Discounts on orders booked before March 1st, 1923:

10 to 24—5 per cent; 25 to 49—10 per cent

TERMS: 25 per cent with order to guarantee acceptance.

Tested queens \$2.00 additional.
Untested queens \$1.00 additional.

50 to 99—15 per cent; 100 or more—20 per cent
Balance before shipment.

OUR GUARANTEE: We guarantee safe arrival and will replace losses or refund money on express delivery receipt signed in full by Express Agent, showing the apparent damage done while in transit. We will also replace any queen that does not give full satisfaction expected.

HUGH M. MATHESON, 418 S. W. 2nd Ave., Miami, Florida

WE ARE BOOKING ORDERS FOR 1923 DELIVERY
ORDER NOW

Berry's Reliable Package Bees and Bright Three-Banded Italian Queens

Twenty-seven years of selective breeding gives us a strain of pure Italian bees that are unsurpassed for their disease-resisting (especially European foulbrood) and honey-gathering qualities. Read what others say about them.

"Enclosed find \$75 for 50 untested queens. I want these for requeening colonies that have European foulbrood, as I find your strain resistant. One of the queens bought of you last season built up from a nucleus and made a surplus of 360 pounds of honey." This same colony with drawn combs furnished, no doubt would have broken the record by making over 700 pounds of surplus. We rear our queens from mothers that are just as good.

"The two-pound packages bought of you made an average of 150 pounds of surplus honey. I find your bees not only hustlers, but also gentle."

Let us mail you our latest circular and price list.

M. C. BERRY & CO., Box 697, Montgomery, Ala., U. S. A.

NOTICE TO BEEKEEPERS

I am offering to the trade of 1923 a pure strain of Italian bees, in three-frame nuclei; also two and three-pound packages. Weather permitting, shipping starts April 1. Health certificate with each shipment. I guarantee every queen purely mated, safe arrival, and pay all honest claims, and save you the trouble of trying to collect from the carrier. My aim is **Quality, Quantity and Quick Service**. I can furnish testimonials from all over the United States and Canada.

Prices: Three-frame nuclei with select untested queen, 1 to 5, \$5 each; 6 to 12, \$4.90.

Two-pound packages with queen, 1 to 5, \$4.50; 6 to 12, \$4.25.

Write for special prices on larger lots.

Terms 10 per cent cash with order, balance just before shipping.

For all cash with order, 3 per cent discount.

Reference: Brunswick Bank and Trust Co., of this place.

A. B. MARCHANT, JESUP, GEORGIA

1923 Package Bees, Nuclei and Queens For Sale

Prolific, bright, three-band Italians only.

Booking orders for April and May delivery. Second to none only in price. They are prolific, gentle, and great honey gatherers. All packages arriving in bad order immediately replaced, express prepaid.

No disease in this territory. Health certificate with each shipment. Try my Special package of two pounds of bees on frame of emerging brood and honey, with queen introduced and laying en route, at \$4.75 each. One-pound package on frame of emerging brood and honey with introduced queen, \$4.00. Bees ship best on frame of honey and brood.

Two-pound package without queen ----- \$3.00

Three-pound package without queen ----- \$5.00

Nuclei same price. Select young three-band queen, with above, \$1.00 extra.

Select untested three-band queen, \$1.25, six \$7; twelve, \$13. Start shipping March 20th.

Formerly TUPELO HONEY COMPANY.

J. L. MORGAN, Apalachicola, Florida

Reference: Apalachicola State Bank.

CHICAGO

FOR QUALITY
FOR SERVICE

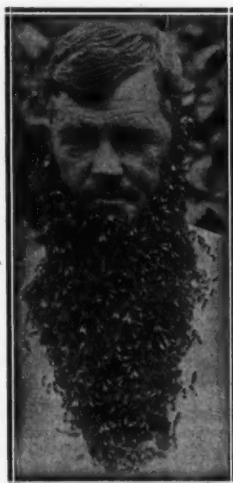
CHICAGO

When you get ROOT QUALITY BEE SUPPLIES from the greatest shipping center in America you get SATISFACTION. You get a superior grade of goods in QUALITY and WORKMANSHIP. Trains leave Chicago daily with connection for your station.

Write for our new free 1923 Catalog.

Let us quote you on your wants.

**A. I. ROOT CO. OF CHICAGO, 224-230 W. Huron Street
CHICAGO, ILLINOIS**



NEW FEATURES FOR 1923

This year we are adding a number of new features which we believe will be of service to our customers.

First: We are placing in operation two hundred additional nuclei, making eight hundred in all, thus materially increasing our output. By our new method of feeding starter colonies, finishing colonies and nuclei when no honey is coming in, we are enabled to rear the very best queens at all times and know you will find them just what you want to head your honey-getting colonies in 1923. Our untested queens have made wonderful records and the color and gentleness of their bees is marked. Untested queens can be shipped at any time after May 15.

Second: In case you want a breeding queen you will be interested in our policy. The breeding queens we have sold in the past have given universal satisfaction and our customers are enthusiastic over them. We are sure many other beekeepers would like to have them but have hesitated about putting \$10 in a single bee, since so many things may happen to a queen during shipment, introduction, etc., to cause her death during the season. By the new plan of service we offer on our Breeding Queens, I assume **ALL THE RISK**.

When you purchase a Breeding Queen from me this year I guarantee the use of her for the season in which she is purchased. Instructions for her introduction and care will be sent, and if any accident whatever happens to the queen, she will be replaced **Free of Charge**. In other words, I propose to sell you **BREEDING QUEEN SERVICE** for the season. We are wintering in nuclei a number of very fine queens and will have more Breeders this season than ever before. The many reports that come to me from those who have used our stock make me believe there is no better strain of bees for honey-getting, gentleness, ability to clean out European foulbrood and all-around vigor. Our Breeding Queens can be shipped any time after April first.

Third: We want to give our customers the very best service as well as high grade queens, and therefore, owing to our increased output and better methods of production, we are able to quote lower prices than ever before.

PRICE LIST—Untested Queens

Before July first:	After July first:
1 to 4, inclusive ----- \$2.00 each.	1 to 4, inclusive ----- \$1.50 each
5 to 9, inclusive ----- 1.95 each	5 to 9, inclusive ----- 1.45 each
10 or more ----- 1.90 each	10 or more ----- 1.40 each
Breeding Queens, service guaranteed for the season, \$10 each.	
A card will bring our catalog.	

JAY SMITH, Route 3, Vincennes, Ind.

NUCLEI

Avoid the rush. Let us book your order for spring delivery.

Nuclei with Queens Introduced

Two-frame with young queen, \$5.00; 25 or more, \$4.50 each.

Three-frame with young queen, \$6.50. 25 or more, \$6.00 each.

We do not weigh the additional bees shaken into our nuclei besides those adhering to the combs, but we invite comparison.

Pound Packages, with Queen caged separately among the Bees:

Two-pound package with untested queen, \$4.50; 25 or more, \$4.00 each.

Three Pounds with untested queens, \$6.00; 25 or more, \$5.00 each.

QUEENS: Prolific enough for "those large hives." Purely mated, and beauties to boot. Bred from selected mothers. Untested, 75c each. Select untested, \$1.00. Tested, \$1.25, postpaid. Several hundred queens reared during honey flow last fall, \$1.00 each while they last. Far superior to the early spring-reared, especially where "Baby nuclei" are used for mating. We use only Standard frame hives.

We guarantee: Pure stock, absolutely free of disease. Safe arrival and complete satisfaction.

Terms: 20 per cent to book, balance prior to shipment.

Yours for a square deal,

JENSEN'S APIARIES, CRAWFORD, MISS.

MACK'S THREE BAND QUEENS

Are reared to possess quality.

We would like to mail one of our catalogs to every beekeeper who reads this ad, whether he keeps few or many bees, buys or rears his own queens or just lets them have their own sweet way. Just send us a postal today stating you want our catalog, and we will do the rest.

HERMAN McCONNELL

Robinson, Ill.

Garden Seeds

The House of Careful Service
Bulbs—Hardy Plants—Nursery Lines

Our stocks are tried, tested, true. Reliable seeds, twenty-four hour shipment, careful attention to instructions, guarantee of safe delivery; these four things we offer. Let Olds' Sturdy Seeds make your garden.



In Clover, Timothy, Alfalfa, Pedigreed Grains and Corn, we are no less dependable. We grow and handle them right.

"Olds Catalog Tells the Truth"

Write for your copy now.

L.L. Olds Seed Company
Drawer 1G Madison, Wis.

BEEES AND QUEENS

Tested Italian queens ----- \$2.00
Hybrid queens ----- 1.00

Queens only with nuclei:

2-frame nuclei—Italian ----- 3.50
2-frame nuclei—Hybrid ----- 3.00
3-frame nuclei—Italian ----- 5.00
3-frame nuclei—Hybrid ----- 4.00

Add price of queen, if wanted with bees. Shipment begins April 1, 1923. No disease ever known in county. Satisfaction or money returned.

DR. J. D. SHIELDS, Rt. 2 Natchez, Miss.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 15th of each month preceding date of issue: If intended for classified department it should be so stated when advertisement is sent.

BEES AND QUEENS

ATWATER offers carload best table honey. 8c. I AM BOOKING ORDERS now for next spring delivery, 3-frame nuclei and queens at the same price as last year. Caucasian or Italian race.

Peter Schaffhauser, Havelock, N. C.

BEES AND QUEENS—I am now booking orders for early spring delivery. Have best strains of Italian bees. Write for prices. N. L. Stapleton, Colquitt, Ga.

BIG bright Golden Italian Queens, the kind that are bred for beauty and also honey gathering qualities. We guarantee to please you. Price, untested, \$1.25 each, 6 for \$6.00, 12 for \$11.00; \$85 per 100. Tested, \$2.00.

Honorville Bee Co., Honorville, Ala.

FOR SALE—Missouri bred Italian queens, \$1 each; 6 for \$5. L. E. Alwein, 1206 N. 13th St. St. Joseph, Mo.

PURE BRED Carniolan Queens. Pure Carniolans are gentler, more vigorous, much more prolific and, better honey gatherers than any Italians. Hardy, disease-resisting, longer-tongued, better winterers; they have no superiors. We are breeding from stock imported direct from Carniola. Watch for our announcement in the March issue.

W. A. Holmberg, Denair, Calif.

PACKAGE BEES—See my display advertisement, this issue, for reduced prices; order early. Pure Italian stock.

C. M. Elfer, St. Rose, Louisiana.

IF YOU are in the market for bees and queens for April, May and June (1923) delivery place your order now. Two-frame nuclei with select untested queens, \$4 each; 3-frame nuclei with select untested queens, \$5 each; three-banded Italian queens, select untested \$1.25 each; select tested \$2.50 each; select tested breeding queens, \$6 each. For carload lots write for special prices. Fifteen per cent deposit to book order, balance payable just prior to shipment. Safe arrival and satisfaction guaranteed.

J. P. Anthony, Apalachicola, Fla.

IF YOU WANT good, bright Italian queens by return mail, send your orders for queens to us; \$1 each; \$11 per dozen, \$80 per hundred. Safe arrival, pure mating and reasonable satisfaction guaranteed in U. S. and Canada. One pound bees with queen, \$3; 2-lbs bees with queen, \$5. We pay delivery charges up to 1,000 miles and guarantee safe arrival in U. S. and Canada. No disease in our apiaries. Graydon Bros., Rt. 4, Greenville, Ala.

ITALIAN BEES AND QUEENS—1 frame of brood and bees, 1 pound of bees, 1 Italian queen, \$5.00. Additional frame of brood or 1 pound of bees with above, \$1.00.

H. P. Le Blanc, 2938 Palmyra St., New Orleans, La.

PINARD'S quality of Root's and Prof. Coleman's strain of bees and queens. Booking orders for spring delivery. Wax cell cups, Benton queen mailing cages and express and parcel post packages for package bees. Promptness and satisfaction my motto. Prices right; circular free.

A. J. Pinard, Morgan Hill, Calif.

IMPORTED QUEENS are a thing of the past for a while, at best, but my breeders from the last queen from Italy are producing excellent results. Price, 1, \$1.25; 6, \$7; 12, \$13; 25 or more, \$1.00 each.

M. G. Ward, Lathrop, Calif.

EARLY ORDER DISCOUNT ON QUEENS—2 and 3-frame nuclei, 2-lb. packages, etc. For orders received during February will book your order with 10 per cent deposit as follows: 1 2-frame nucleus, \$4.75; 12 or more, \$4.30. 1 3-frame nucleus, \$5.75; 12 or more, \$5.30. 2-lb. package same as 2-frame nucleus. All are furnished with purely mated young Italian queens. Write for descriptive circular and price list in full. These prices hold good only for orders received during February. Satisfaction and safe arrival guaranteed in U. S. A. and Canada. Reference: First Nat. Bank of Clarksville. Baughn Stone, Box 13½ Clarksville, Texas.

BEES AND QUEENS—See our large ad elsewhere in this issue. J. L. Morgan, Apalachicola, Fla.

WE want your orders for nuclei for 1923. As good stock as anyone has and as prompt shipment as any can make, from and after April 1. Safe arrival guaranteed. See our prices before you buy. Disease unknown in our territory.

Christopher & Puett, Moultrie, Ga.

FOR SALE—Golden queens of 15 years' careful breeding; untested, \$1.25 each, or 6 for \$7.00; 12 or more, \$1.00 each. Tested, \$2.00 each. One-lb. package with untested queen, delivered, \$3.25; 2-lb. package with untested queen, delivered, \$5.00. Promptness and satisfaction my motto. Shipments beginning about April 15.

R. O. Cox, Box 25, Rutledge, Ala.

BOOKING ORDERS for May delivery. Prize-winning 3-banded Italian bees. 2-lb. package, with select untested queen, \$5; 10 packages or more, \$4.75 each; 3-lb. package with queen, \$6.75. I guarantee safe delivery and satisfaction.

C. H. Cobb, Belleville, Ark.

PETERMAN'S QUEENS have the name and reputation of being leaders in quality, size and color. I sort out and ship only a large select, thrifty laying queen, killing all that do not come up to this standard. The past season proved to me this pays big for repeat orders. Prices: 1, \$1.25; 6, \$7.00; 25 at \$1.00 each. Circular free.

H. Peterman, R. F. D., Lathrop, Calif.

GOLDEN QUEENS, GOLDEN—Ready after April 1. Untested, 1, \$1.25; dozen, \$11; select untested, 1, \$1.50; dozen, \$13.50. Write for prices on nuclei and pound packages. Pure mating and safe arrival guaranteed in U. S. and Canada.

Tillery Bros., R. 5, Greenville, Ala.

PACKAGE BEES for 1923 delivery. Burleson's "Old Reliable" three-banded Italian bees and queens. None better; two (2) pound packages, \$4.25, and three (3) pound packages \$5.50 each. Select untested queen with each package. Ten per cent (10%) down with order, balance fifteen (15) days before bees are to be shipped. I use sugar syrup for feed in transit and guarantee no disease and safe arrival.

T. W. Burleson, Waxahachie, Texas.

NUCLEI—June or July delivery; large, strong, three-frame nuclei with queen, at \$4.75 each; lots of 10 at \$42.50.

The Foster Honey Company, Boulder, Colo.

QUEENS—High-grade Italian queens. Three-banded; also goldens. Untested, 1, \$1.25; 6, \$6.50; 12, \$12.00. Tested, 1, \$2.00; 6, \$11.50; 12, \$22.00. If other grades of queens are wanted, write for prices. Orders booked for one-fourth cash, prices for April, May and June. Safe arrival and satisfaction guaranteed. We will replace all mismatched queens. No disease. P. O. Watkins, Cullasaja, N. C.

GOLDEN ITALIAN QUEENS—Produce bees solid yellow to tip; disease resisting, prolific, gentle and good honey gatherers. Untested, \$1.25; select untested, \$1.50 each; tested, \$3.00. Dr. White Bee Company, Sandia, Texas.

OLD, RELIABLE QUEEN-BREEDER—In bee work 22 years. Three-banded queens. 3-frame nuclei, packages and full colonies, any quantity. Ready after April 1.

Curd Walker, Scotts Station, Ala.

DO YOU NEED QUEENS?—Try mine; you cannot beat the quality at any price. Am working for the name of being honest and reliable, selling the best queens. Let me show you. Circular with prices free.

H. Peterman, R. F. D., Lathrop, Calif.

SHE-SUITS-ME QUEENS—1923—\$1.50 per queen, after June 1. One dollar per queen when ordered not less than four weeks in advance.

Allen Latham, Norwichtown, Conn.

THREE-BANDED ITALIAN QUEENS—Select untested, \$1 each; \$10 per dozen. Pound packages of bees; golden Italian queens at above prices; honey gatherers (no disease). Satisfaction guaranteed.

W. T. Perdue & Sons, Fort Deposit, Ala.

FOR SALE—1,000 lbs. of package bees after April 10. Queens, \$1, after May 15, from home yard. Circular free.

F. M. Russell, Roxbury, Ohio.

THREE-BAND BRIGHT ITALIAN QUEENS for 1923. Guaranteed purely mated. Good hustlers and gentle. One, \$1; 6, \$5; 12, \$9. Write for folder on the principle of introducing. Orders booked as received.

J. Frank Diemer, Liberty, Mo.

PACKAGE BEES for 1923—Now booking orders for Yancey Hustlers. See larger ad for prices. Caney Valley Apiaries, Bay City, Texas.

Yancey Bros., Owners.

BURLESON'S "Old Reliable Three-banded Italian Queens," guaranteed none better. Untested, \$1.25 each; \$12 per dozen. Select untested, \$1.50 each; \$15 per dozen. Queens ready to ship April 10th. Send all orders, with remittance, to my manager, J. W. Seay, Matthis, Texas.

T. W. Burleson, Waxahachie, Texas.

QUEENS, QUEENS—From my old leather-back Italian queen. She is the head of my apiaries. Ready to ship after April 15. Untested, \$1.25; 12, \$1 each. Select untested, \$1.50; 12, \$1.25 each. Tested, \$2.50; 12, \$2.25 each. Select tested, \$3.00 each. O. O. Wilder & Son, Rt. 2, Box 14, Corpus Christi, Texas.

REDUCED PRICES on packages, nuclei and queens for spring delivery.

J. J. Scott, Crowville, La.

TRY THE ACHORD STRAIN OF ITALIANS—They have produced wonderful honey crops in many states. A postal will bring you a descriptive price list of swarms and queens.

W. D. Achord, Fitzpatrick, Ala.

NUCLEI, PACKAGE BEES AND ITALIAN QUEENS for spring delivery, the kind customers recommend to their friends. We have been shipping queens and bees for many years and aim to please our customers. Three-banded Italian queens, untested, \$1; tested, \$2. Write for price list on breeders, combless bees and nuclei.

Allenville Apiaries, Allenville, Ala.

SEE our large Ads. elsewhere in Journal for both bees and sweet clover seed. Both are great honey producers.

M. C. Berry & Co., Montgomery, Ala.

FOR descriptive price list of Carniolan, Caucasian, Italian and Golden queens, write to Grant Anderson, Rt. 2, Waco, Texas.

CARNIOLANS—No better strain can be found in the United States than stock my Carniolan queen yard. Price, 1, \$1.25; 6, \$7; 12, \$13; 25 or more, \$1 each.

M. G. Ward, Lathrop, Calif.

GOLDEN ITALIAN QUEENS—Good as the best. Ready April 15. Select untested, \$1.25; dozen, \$13; Select virgins, 60c; dozen, \$5. Safe arrival and satisfaction guaranteed. A trial solicited.

Crenshaw County Apiary, Rutledge, Ala.

3-BAND ITALIANS, developed from the best and most popular strains by continuous selection. When I can produce or discover better, they will be adopted. Queens, untested, after May 15, \$1.50 each, 6 for \$8. Tested, \$2.50 each. **CARNITALIANS**—Five miles from my Italian yard I raise Carnitalians, a cross derived from Jan Strgar Carniolan queens and Golden Italian drones. I calculate fifty years to get color marking fixed. Don't wait for that; the blend of blood and quality is there now. Tested queens, after June 1, \$2.50 each.

John Protheroe, Rustburg, Virginia.

FOR SALE—1923 golden Italian queens, \$1.25; dozen, \$12. Safe arrival and satisfaction guaranteed.

J. J. Sanford & Son, McKenzie, Ala.

FOR SALE—Pure Italian bees and queens, 3-banded, 2-pound packages with selected queens, 1 to 5, \$5; 5 to 25, \$4.75; 25 or more, \$4.50, delivered. Queens, 1 to 50, \$1 each; 25 per cent cash books the order, balance a few days before shipping season begins. Shipping season opens April 15. N. disease; safe arrival and satisfaction. We ship only the best.

W. C. Smith & Co., Calhoun, Ala.

HAVE YOU READ Hiram Bear's advertisement on page 90. Do so before placing your order for bees.

PACKAGE BEES—2000 big, strong, healthy colonies; will be ready to supply package bees in the spring. Italian or Carniolan queens. Let me quote prices and book your order early. A small deposit reserves shipping date. Circular free.

J. E. Wing, 155 Schiele, Ave., San Jose, Calif.

GOLDEN ITALIAN QUEENS for 1923, the big, bright, hustling kind. Satisfaction guaranteed. Price, untested, \$1 each, 6 for \$5, 12 for \$10, \$75 per 100. Tested, \$1.75 each; also a few 1 and 2-frame nuclei. Write for prices on nuclei.

E. F. Day, Honorville, Ala.

PACKAGE BEES and nuclei. See add on page 90. Lovett Honey Co., 602 N. 9th Ave., Phoenix, Ariz.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas.

E. B. Ault, Prop.

SEE my display ad. in this number.

Jes Dalton, Bordelonville, La.

ITALIAN BEES, brood and young queens for delivery April 15 to June 15. One frame emerging brood and bees, one extra pound of bees, one young Italian queen, all for \$5.00; 25 or more, \$4.75; 50 or more, \$4.50. Bright three-banded stock only; no disease; safe arrival and satisfaction guaranteed; 25 per cent deposit to book order.

R. S. Knight, R. F. D. 2, New Orleans, La.

SEE MY DISPLAY ADV. for package bees, queens and nuclei.

W. H. Moses, Lane City, Texas.

HARDY ITALIAN QUEENS, \$1 each.

W. G. Lauver, Middletown, Pa.

FOR SALE—60 colonies bees, with location or without location.

Carl Sommerdorf, Brownston, Minn.

"FLORIDA FIRST" QUEENS for April, May and June, \$1.50 each; 5 for \$7. Early order discounts during January and February. Circular free. R. C. Boswell, Manager, Indian River Apiaries, Wilson, Fla.

BEES AND QUEENS—I have a limited amount of hybrid bees, not fully Italianized, I am going to offer for spring delivery at the following bargain prices: 1-lb. package, \$2.75; 10 or more, \$2.50 each; 2-lb. package, \$3.75; 10 or more, \$3.50 each; 3-lb. package, \$4.25; 10 or more, \$4.00 each. Young untested Italian queen included with each package at the above named prices. This is a real saving to the purchaser, for in a few weeks the colony will Italianize. Ten per cent books your order. Prompt and safe delivery guaranteed. Never had a case of foulbrood in my apiaries. Would urge my old customers to place orders early.

H. E. Graham, Gause, Texas.

BEES AND QUEENS at reduced prices. Cypress hives for sale. Write for terms.

Otto Diestel, Elza, Ga.

CARNIOLAN QUEENS—None better. Select tested, \$2.50 each; select untested, \$1.25 each. Also choice Italians, same prices. Send for circulars.

Geo. W. Coltrin & Son, Mathis, Texas.

WATCH for our announcement relative to pure Carniolan queens in the coming issue of this Journal. It will have a message of vital importance to you.

Holmberg, Denair, Calif.

MY BREEDING STOCK contains breeders from the last imported queen from Italy, and they are good queens.

M. G. Ward, Lathrop, Calif.

HONEY AND BEESWAX

ATWATER offers carload best table honey, 8c. **FOR SALE**—White and amber extracted honey. Write for prices. State quantity wanted. Dadant & Sons, Hamilton, Illinois.

CARLOAD BUYERS WRITE—Fine alfalfa clover honey, carlot, 8c pound.

E. F. Atwater, Meridian, Idaho.

FOR SALE—Several tons of light amber and white clover extracted honey, strictly A No. 1. Send in your offers, or write me.

Lee Horning, Rt. 4, Morrison, Ill.

HONEY FOR SALE—In 60-lb tins; water white orange, 14c; white sage, 12c; extra light amber sage, 10½c New York State buckwheat, 10c, for immediate shipment from New York.

Hoffman & Hauck, Woodhaven, N. Y.

FOR SALE—Comb and extracted honey.

W. C. Moon, Henry, Ill.

FOR SALE—9 barrels extra fine extracted white clover honey, 7 barrels fine light amber fall honey. Can put this honey up in 60-lb. tin cans and 5 and 10-lb. tin pails. Purity and quality guaranteed. Prices on application if you state quantity wanted. Sample 10c.

Emil J. Baxter, Nauvoo, Ill.

BULK COMB and extracted clover honey; finest quality. Sample 10c. Prices upon request.

C. S. Engle,

1327 23rd St., Sioux City, Iowa.

HONEY SALE—Some extra choice clover honey; state quantity. Satisfaction guaranteed.

Maplewood Apiaries,

Dubuque, Iowa.

FOR SALE—Michigan milkweed-raspberry white honey, mild and deliciously pleasing. In 60-pound cans, at 12½c per pound.

A. G. Woodman Co., Grand Rapids, Mich.

QUALITY HONEY in 5-lb. pails.

Van Wyngarden Bros., Hebron, Ind.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans; also white alfalfa in cans. State quantity wanted and we will quote prices. Samples on request.

Dadant & Sons, Hamilton, Ill.

WATER WHITE, white and sweet clover mixed. Granulated, \$7.20 per 5-gallon can; 10-lb. pails liquid, \$9.00 per case of six; 5-lb. pails liquid, \$9.15 per case of twelve. Write for prices in larger quantities.

Sioux Honey Association, Sioux City, Iowa.

FOR SALE—White honey in 60-lb. cans; also West Indian in 50-gal. barrels. Samples and prices on request.

A. I. Root Co.,

23 Leonard St., New York City, N. Y.

FOR SALE—Clover honey, 12c lb. Light amber, 11c; 2 60-lb cans to case. No. 1 white comb, \$5.00 case. No. 1 amber, \$4.00. All 24-section cases.

Lewis Klaty, Carsonville, Mich.

EXTRA FINE light amber honey in cases of twelve 5-lb. pails, \$9.60; twelve 10-lb., \$18; F. O. B. Lansing. This honey is liquefied and filtered, making it a very fine product.

W. A. Lexen, East Lansing, Mich.

WHITE CLOVER EXTRACTED HONEY—None finer. Sample 15c.

The Hodgkin Apiaries, Rochester, Ohio.

FOR SALE—Clover and buckwheat extracted honey in new 60-lb cans, two to the case.

John DeMuth & Son, Pembroke, N. Y.

CHOICE extra fancy white clover honey in new 60-lb. cans, 120 lbs. net, \$13. Also a few cases of Hubam honey, same price. Write for prices on larger quantities. Sample 20c. No. 1 comb honey, \$4 per case of 24 sections. No. 2, \$3 per case; 8 cases to carrier.

Edw. A. Winkler, Rt. 1, Joliet, Ill.

FOR SALE—No. 1 sweet clover honey, 60-lb. cans, \$7.00; 6 or more, \$6.00; 10-lb. pails, \$1.25; 5-lb. pails, 75 cents.

A. Mottaz, Utica, Ill.

FOR SALE—No. 1 white comb, \$6 per case; No. 2 white, \$5 per case of 24 sections; dark comb \$1 per case less; in 24 case lots 50c per case less; dark and amber extracted 10c per pound, two 60-lb. cans to case; amber baking honey in barrels, 8c per pound. Discount on extracted in quantities.

H. G. Quirin, Bellevue, Ohio.

FOR SALE—Bees, comb and extracted honey.

A. L. Kildow, Putnam, Ill.

FOR SALE—Choice clover extracted honey in case or carload lots. Comb honey in Danz. and Beeway sections, packed in 6 or 8-case carriers. Quality unexcelled.

J. D. Beals, Oto, Iowa.

BEESWAX WANTED—We need large quantities of beeswax and are paying good prices now. Ship to us at Hamilton, Ill., or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your own station, as you may desire.

Dadant & Sons, Hamilton, Ill.

FOR SALE—Choice new clover extracted honey; put up in new 60-lb cans. Write for prices, stating quantity desired.

W. M. Peacock, Mapleton, Iowa.

HONEY—Atwater sells fine alfalfa-clover honey, extra strong cases, case of two 60-lb. cans, \$12; case of twelve 5-lb. pails, \$7.50, all f. o. b. here. Ten-lb pails all sold out; plenty of the others on hand.

E. F. Atwater, Meridian, Idaho.

SUPPLIES

ATWATER offers carload best table honey, 8c. **BEE EQUIPMENT**—For extracted or comb honey. Write for prices.

The Foster Honey Company, Boulder, Colo.

CONNECTICUT and Rhode Island headquarters for Root's Beekeepers' supplies.

A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—Section holders, separators, followers, and springs for standard 4¼x1½ sections and supers for sale one-third catalog price; any quantity; good as new.

Bert W. Hopper, Rocky Ford, Colo.

FOR SALE—Regular Hoffman self-spacing frames, \$4.00 per hundred. Ideal self-spacing, \$3.00 per hundred.

E. G. Lewis, Beeville, Texas.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list.

The Colorado Honey Producers' Association, Denver, Colo.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.

American Bee Journal, Hamilton, Ill.

FOR SALE

ATWATER offers carload best table honey, 8c.

MOUNTAIN BRED ITALIANS—Nuclei, \$5 and \$6. See advertisement on page 90.

Hiram Bear, Hinton, West Virginia.

FOR SALE—Apiary in Salt River Valley, Arizona, consisting of 160 live colonies, sufficient supers, frames, etc., for 250 colonies, portable, extracting house, power equipment and an abundance of miscellaneous equipment. Write: J. W. Wright, Box 699, Safford, Ariz.

FOR SALE—Complete, modernly equipped apiary, choice location; no local competition; mountain altitude; 150 colonies bees, in new 10-frame hives, new winter cases, up-to-date honey extracting and canning equipment. Best reasons for selling. Or will rent on shares, optional purchase.

The Little Horn Apiaries, Crow Agency, Mont.

APIARY FOR SALE—Five well located apiaries equipped for extracted honey production for sale at exceptionally low prices.

Foster Honey Company, Boulder, Colo.

FOR SALE—1,000 extracting supers with comb; no disease. Pure buckwheat flour and extracted clover honey; also 300 colonies of bees.

Chester E. Keister, Orangeville, Ill.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.

Superior Honey Co., Ogden, Utah.

FOR SALE—10-frame beehives, metal roofed. Price reasonable. Prompt service.

Thomas Corder, Sparta, Wis.

FIRST-CLASS BROOD COMBS in Hoffman frames, drawn from full sheets of foundation, 30c each, or \$25 per hundred.

C. S. Engle,

1327 23rd St., Sioux City, Iowa.

FOR SALE—80-acre farm, 3 miles from town. Good buildings; good location for a beekeeper.

M. A. Smith, Goldfield, Iowa.

Beeville Apiary.

FOR SALE—All or part interest in 350 colonies bees on never-failing Alfalfa-Sweet Clover range; if not sold will lease.

Beekeeper, 1716 Rose St., Berkeley, Calif.

CARNIOLANS and **ITALIANS**—I am doing my own work, and I am out to give the service you expect. Give me a trial and I will prove it.

M. G. Ward, Lathrop, Calif.

FOR SALE—72 colonies Italian bees, in good 10-frame standard hives, extracting supers, extractor and other equipment.

R. W. Weisser, Care Levitt Investment Co., Sioux City, Iowa.

FOR SALE—Good second-hand 60-lb cans, two cans to a case, boxed, at 60c per case f. o. b. Cincinnati. Terms cash.

C. H. W. Weber & Co., 2163 Central Ave., Cincinnati, Ohio.

BEES FOR SALE—Nuclei or colonies. Write for special prices on large quantities.

Box 437, Boulder, Colo.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans; also white alfalfa in cans. State quantity wanted and we will quote prices. Samples on request.

Dadant & Sons, Hamilton, Ill.

MISCELLANEOUS

ATWATER offers carload best table honey, 8c.

CASH for old bee books and journals. Write to me what you have.

Francis Jager,

University Farm, St. Paul, Minn.

THE BEE WORLD—The leading bee journal in Britain, and the only international bee review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. The Apis Club, Benson, Oxon, England. Send us a post-card today. It is well worth your little trouble.

STRAWBERRY PLANTS—Senator-Dunlap exclusively, \$4.00 per 1,000; good stock, well grown.

S. D. Parks, Brownville, Neb.

SAW TABLE—Real Bargain in a Sidney No. 1 wood-working machine, with 6-fooe Mee-reen-Johnson cut-off table and large assortment of common and smooth-cutting rip and cut-off saws, matcher, dado, other heads, etc. Fully equipped for manufacturing complete beehives, crating, shipping cases and general shop work. Further particulars on request.

The Hofmann Apiaries, Janesville, Minn.

FOR SALE—Hubam annual sweet clover seed. Grown in rows and kept perfectly clean, therefore absolutely pure. Price, 50c per pound in lots less than one bushel; one bushel or more, \$25.00 per bushel. All f. o. b. Holgate, Ohio.

Noah Bordner, Holgate, Ohio.

PLANS FOR POULTRY HOUSES—All styles, 150 illustrations; secret of getting winter eggs, and copy of "The Full Egg Basket." Send 25 cents.

Inland Poultry Journal, Dept. 56,

Indianapolis, Ind.

HON-E-NUT CANDIES—Made from pure honey, nuts and chocolate. The most wholesome candy made. Try it and be convinced; \$1 per pound, postpaid.

Fairmount Apiaries, Schuylkill Haven, Pa.

HUBAM—Genuine pure certified re-cleaned scarified Hubam seed. Most wonderful honey plant; blooms from June till November; produces a white, delicate-flavored honey similar to white clover; and insurance against crop failures and fall feeding. A boon to the farmers for soil building, pasturage, hay, ensilage, etc. Write for prices.

Edw. A. Winkler, Rt. 1, Joliet, Ill.

SITUATIONS

ATWATER offers carload best table honey, 8c.

ACTIVE young man, age 21, with four years' experience in beekeeping, wishes position this season with commercial beekeeper, queen breeder preferably, or would consider working limited number colonies on share basis. Best references furnished. Address

J. C. Allen, Alpine, Ala.

STILL HAVE ROOM for one young man to learn beekeeping. Board and something more given in return for services rendered. None but those clean in mind and body need apply. Smoking not allowed. Would like an energetic, active beekeeper who understands a "Reo" speed wagon. R. F. Holterman, Brantford, Ontario, Canada.

WANTED—Single, young or middle-aged conscientious, energetic and willing assistant experienced in extracted honey production, to help in 600 to 700 colony business and general farming on a small scale when not busy with bees. Must be handy at common shop work. Give present occupation, age, height, weight and wages expected; also references regarding character, habits, experience with bees, farm work, trucks and automobiles, all in first letter. Steady job for right party. Objection to cigarettes and tobacco chewing. Can also use well recommended farmer, handy in general, having some beekeeping experience and desiring to learn more.

The Hofmann Apiaries, Janesville, Minn.

SITUATION WANTED—Thoroughly experienced beekeeper wishes position for the coming season; connection with large producer preferred. Wages or shares.

W. J. Cass, 818 W. 5th Ave, Denver, Colo.

EXPERIENCE AND FAIR WAGES to active, industrious young man for help in well-equipped apiaries. Six hundred and fifty colonies April to December. State age, height, weight, occupation and wages desired. The Pettit Apiaries, Georgetown, Ontario, Can.

WANTED—Student apiary assistant, coming season; experience not essential; lady preferred. Near Waco, Tex. Address,

B. F. Newman, Axtell, Texas.

WANTED—Experienced bee man to work several hundred colonies bees on shares. Must be a hustler. Please give references in first letter.

Mathilde Candler, Cassville, Wis.

WANTED

ATWATER offers carload best table honey, 8c.

WANTED—Old postal stamps and envelopes.

R. LeMang, 26 Quincy St., Passaic, N. J.

WANTED—Saw table, also extractor,

Lorenzo Clark, Winona, Minn.

WANTED—100 stands of Italian bees; will have to be cheap.

R. Keays, 1016 N. Virginia St., El Paso, Tex.

WANTED—1 or 2 cars of white extracted honey (in new 60-lb. cans), or similar amount in 1 to 5-ton lots. If satisfactory I will call on those mailing sample and quoting lowest spot cash price.

A. W. Smith, Menningham, Mich.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.

Superior Honey Co., Ogden, Utah.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co., 204 Walnut St., Cincinnati, Ohio.

BEEWAX WANTED—We need large quantities of beeswax and are paying good prices now. Ship to us at Hamilton, Ill., or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your own station, as you may desire.

Dadant & Sons Hamilton, Ill.

SITUATION WANTED for the season of 1923 in commercial apiary, or as assistant, with queen breeder, by middle-aged unmarried man of perfect character. Have fair experience with bees. The South or West preferred, though others may write. Offers solicited.

Joe Gates, Rt. 4, Hazen, Ark.

FOR EXCHANGE

FOR SALE OR TRADE—160 acres in Aitkin County, Minnesota, near Grayling, one-half mile from the highway, between Brainard and Duluth. Will trade for bees and bee supplies.

George Wicks, Elmore, Minn.

WANTED—To trade typewriter for repeating rifle or shotgun.

H. N. Boley, Hillsboro, Iowa.

WANTED—Two-frame extractor.

Max Thaler, Rt. No. 4, Taylor, Texas.

WANTED—Bees, season 1923, on share basis, any quantity. Have excellent locations and best system of handling. Thorough training and wide experience assures results. Write.

C. I. Graham, Yuba City, Calif.

WANTED—By widow, correspondence with persons living in Wyoming, Colorado, California or Washington, who will describe country, climate and crops. Address

1217 First Ave. North, Faribault, Minn.

WANTED—Foundation mill outfit.

C. C. Baker, Ellensburg, Wash.

WANTED—By experienced man, about 200 colonies of bees to work on shares; must be well equipped and in good honey-producing section; will give bees good care.

M. Knudsen, 153 Institute Place, Chicago, Ill.

WANTED—Second-hand four-frame power or hand extractor (power preferred) with pockets twelve inches wide. Also Peterson capping melter. They must be in first-class condition.

A. D. Flint, South Valley, N. Y.

WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 1922 price list. Our quotations will interest you.

The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

TOO LATE TO CLASSIFY

FOR SALE—300 to 500 colonies bees in fine shape; free from disease; 1 acre land with buildings, with lease for two seasons free with 300 colonies of bees or more; price \$7.00 per colony, with two section comb honey supers with each colony; \$4.00 per colony cash, balance time to suit. Fine alfalfa and sweet clover range, 3½ miles from town.

Bert W. Hopper, Rocky Ford, Colo.

PURE Italian Bees and Queens, as good as the best. Prices: Untested, \$1.00 each or \$10 per dozen. Package bees, 1 lb., with untested queen, \$2.50; 2-lb. packages, with untested queen, \$3.50; no disease. Our bees are state inspected.

O. P. Hendrix & Son,

West Point, Miss.

FOR SALE—100 hives of fine Italian bees, in 8 and 10-frame standard hives. Combs built on wired foundation. Hoffman frames. About 300 comb-honey supers. Located in fine alfalfa belt. Price, \$6.00 per hive for outfit and equipment. Reason for selling, owner leaving for west. For full particulars write,

Harry E. Thornberry, Cairo, Ill.

FOR SALE—60 colonies of bees. Healthy and in up-to-date good hives.

Duane Shaw, Palestine, Ill.

Booking Orders for May Delivery 1923

My introduced-laying-enroute queens and packages. One good, vigorous, young queen, one standard Hoffman frame of emerging brood and adhering bees, and one additional pound of bees. Price complete f. o. b. Bordelonville, \$5.00.

Additional frames of brood, or additional pounds of field bees to make larger package, \$1 each, respectively in above packages. Bees and queen Italians. Queen introduced and laying enroute to you. Health certificate attached. Safe arrival and satisfaction guaranteed. One-fifth cash books order. Send for circular and names of satisfied customers in your state. Complete references given.

Jes Dalton, Bordelonville, La.

Package Bees and Three-Banded Italian Queens

Read the article, page 19, January issue, American Bee Journal, and be convinced package bees are what you need.

A customer in Canada advises the 30 2-lb packages I sent him averaged 150 lbs. surplus honey per colony. His net profit should have been \$500 or more. Good queens cause this heavy average. I rear only that kind.

Prices on Package Bees F. O. B. Via Express:

1-lb. package, including young queen	-----	\$3.50
2-lb. package, including young queen	-----	5.00

Ten or more packages, either size, 25c per package less. Can make shipment via parcel post, postage paid; 10 per cent higher if sent that way. Prices on select (one grade) untested queens, \$1.25; 10 or more \$1.15 each. Safe arrival of bees and queens, pure mating, and a square deal guaranteed. Am booking orders with 10 per cent cash, balance just before shipping. Shipment will be made on the day you name. No disease.

JASPER KNIGHT, Hayneville, Ala.



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You can have cash for your wax and old combs or cappings at the market price, or we allow a little more in exchange for supplies

Write for our terms and prices

"falcon" Supplies, Queens, Foundation

Booklet, "Simplified Beekeeping for Beginners" free

Write for catalog

W. T. FALCONER MFG. COMPANY, Falconer, (NEAR JAMESTOWN) N. Y., U. S. A.

"Where the BEST Beehives come from"



QUEENS

PACKAGE BEES NUCLEI

QUEENS



FOR YEARS WE HAVE BEEN SHIPPING THOUSANDS OF
POUNDS OF BEES ALL OVER THE U. S. A. AND CANADA

Now is the time to place your order for spring.

Send for our 1923 Circular, it's free.

We can save you money by ordering early.

The very best of Bees and Queens.

ITALIANS

CARNIOLANS

GOLDENS



NUECES COUNTY APIARIES, CALALLEN, TEXAS

BEES IN PACKAGES

Vigorous Italian queens and bees in packages; thoroughbred three-banded stock; activeness and prolificness of queens guaranteed. Standard nuclei with frames that fit Root standard hives, also combless packages. I consider three-frame nuclei superior to three-pound combless packages, and would advise my customers to purchase nuclei. My bees are absolutely free from disease, and have never at any time had any disease. Shipments begin about April 15. Order early and be in time for the booking. I ship to numerous parts of the United States and Canada every spring. All queens I sell are young, also laying.

Two-lb. package, with queen, 1 to 20	\$5.00 each
Two-lb. package, with queen, 25 or more	4.50 each
Three-lb. package, with queen, 1 to 20	5.50 each
Three-lb. package, with queen, 25 or more	5.00 each
Three-frame nuclei, with queen, 1 to 20	5.50 each
Three-frame nuclei, with queen, 25 or more	5.00 each

TERMS: Cash with order.

As I ship by express, be sure to state name of express station.

C. M. ELFER, ST. ROSE, LOUISIANA

Package Bees and Queens

Three-Band Italians, Bred for Honey Production. Booking orders for spring delivery. The **Very Best of Bees and Queens**. I guarantee them to equal any on the market at any price, in regard to **Honey Gathering, Prolificness, Gentleness and Disease Resistance**. If customer is not fully satisfied in every way that they are as good as any, money will be returned.

2-lb. packages, after May 1: One, \$3.50; 25, \$3.25. Three-pound: One, \$5.00; 25, \$4.75.

Queens, after April 1: 1, \$1.25; 6, \$1.20; 12, \$1.15; 25, \$1.10. For quantities, write. Queens 20 per cent off with packages. 20 per cent books order, 5 per cent discount each month in advance. Write today for free booklet describing my stock and methods.

ULIS BLALOCK, Christine, Texas.

THIS IS THE
CYPRESS "MARK OF
DISTINCTION"



TRADE MARK REG. U.S. PAT. OFFICE

IT'S STAMPED
ON EVERY PIECE OF
"TIDEWATER"
CYPRESS

"ALL
HEART"
FOR
BEE-
KEEPERS'
USE
(Of Course)

THE MAN WHO BUYS CYPRESS MINUS THE
ARROW TRADE-MARK AND THINKS HE IS
GETTING

"TIDEWATER" CYPRESS

"The Wood Eternal"

IS EITHER EXTREMELY "SHORT-SIGHTED"
OR EASILY SATISFIED, OR BOTH.

WISE MEN SAY "SHOW ME!"

(THE TRADE MARK)

"ALL
HEART"
FOR
BEE-
KEEPERS'
USE
(Of Course)



SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

1251 POYDRAS BLDG., NEW ORLEANS, LA., or
1251 GRAHAM BLDG., JACKSONVILLE, FLA.



THE DIAMOND MATCH CO.

(APIARY DEPT.)

MANUFACTURERS OF
Beekeepers' Supplies
CHICO, CAL., U. S. A.

Dadant's incomparable Foundation
is always kept in stock. Western
Beekeepers can be supplied advantage-
ously.

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HOFFMAN & HAUCK, 1331 Ocean Ave.
WOODHAVEN, N. Y.

The Diamond Match Company re-
quires responsible agents in the Cen-
tral States who are in a position to
handle car load lots.

BEEKEEPERS, wherever they may be located, before de-
ciding where to obtain supplies, should write to the
Diamond Match Co. for prices and for their Beekeepers'
Supply Catalog.

They own their own timberlands and sawmills, from the tree
to the finished product; no middleman takes out a profit.

Full advantage of this low cost of production is given to the
purchaser.

The Apiary Department (which is in charge of experienced
supply men, who are also practical beekeepers) maintains a
constant excellence of product and offers unsurpassed ser-
vice.

ALUMINUM HONEYCOMBS

The Diamond Match Co. and their agents are the sole dis-
tributors in the United States of the Aluminum Honeycombs,
manufactured by the Duffy-Diehl Co., Inc., of Pasadena,
Calif. Write for descriptive pamphlets. Eastern beekeep-
ers should send their orders for the Diamond Match Co.'s
supplies to Hoffman & Hauck, 1331 Ocean Avenue, Woodhaven, N. Y.

DIAMOND MATCH CO., Apiary Department
CHICO, CALIFORNIA

THE BEST BIG HIVE

can be made from your present Standard equipment. The most successful beekeepers have proven this under all conditions. The best results in honey production and the most certain, sure feeding known follows the use of a Standard 10-frame hive as a brood chamber and a shallow extracting super as a food chamber. This arrangement will give you the **most profitable big hive** on the market. The queen will have plenty of room for brood rearing and the expansion of the colony will take place naturally and easily and with little **danger of swarming**. As the bees empty the cells in the food chambers the queen can expand the brood nest. This food chamber is a big labor-saver, as the beekeeper does not have to feed, thus an insurance against starvation, as the bees are always sure of feed. Bees provided with plenty of natural stores in a food chamber will **winter better** and stronger, and will rear brood faster in the spring. Such a strong colony, surrounded with plenty of honey at all times, will actually increase the weight of their stores under a shortage of nectar, while a weaker colony, in any other hive, Jumbo or Langstroth, without a food chamber, will starve. The beekeeper can raise this food chamber and put his extra supers, comb or extracted, next to the brood chamber, right where they belong. Therefore, the best big hive to be had today is



The food chamber, a regular shallow extracting super.



Standard 10-frame hive with separate food chamber.

The Food Chamber Hive

REASONS:

1. Standard Equipment.
2. High Re-sale Value.
3. Certain, Sure Feeding.
4. Strong, Vigorous Colonies.
5. Winter Better.
6. Colony can be Expanded Easily.
7. Little Danger of Swarming.
8. The Biggest Hive (4146 Sq. In. Comb Surface).
9. Cheapest Hive (per Square Inch Comb Surface).

BUY STANDARD BEE SUPPLIES
THE BEST AND CHEAPEST IN THE LONG RUN

Send for our 1923 Catalog.

A. I. ROOT COMPANY, Medina, O.
West Side Station